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ABSTRACT

This report documents the planning process and the decisions involved in master planning a proposed Honolulu high school, and it provides guidance for the implementation of those increments remaining after phase one of the first increment had been completed in September 1972. Phase two of the first increment and the second increment are now under design. Plans for ten increments are included. The latest time schedule listed is the seventh increment, which design is to be started in August 1977 and the construction completed in August 1979. Included in the report are one-line diagrams for all classroom buildings; ultimate civil (grading, drainage, sewer, water, and gas) and electrical (power and communications) plans; incremental construction plans based on the development schedule; estimation of capital costs for each increment; and a budgetary program to implement the plan. (Maps and blueprints on pages 4, 21-22, 31-33, 62-65, 68, 73, 76, 82, 85, 91-92, and 94-96 may reproduce poorly.) (Author/MLF)

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COMPLEX DEVELOPMENT REPORT

MOANALUA HIGH SCHOOL

STATE OF HAWAII

DEPARTMENT OF EDUCATION

DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES

D.A.G.S. JOB NO. 02-16-5240.2

ANBE, ARUGA & ISHIZU, ARCHITECTS, INC.

EA 006 105

ANBE, ARUGA & ISHIZU, ARCHITECTS, INC.

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July 5, 1973

Mr. KeNam Kim, Comptroller
Department of Accounting and
General Services
State of Hawaii
Honolulu, Hawaii 96813

Dear Mr. Kim:

We submit herewith this Complex Development Report for the proposed Moanalua High School, Honolulu, Oahu, Hawaii in accordance with our consultant services contract.

We are pleased to have contributed toward a solution for the urgent educational needs at Moanalua.

This report is the result of cooperative effort and we extend our sincere aloha to Mr. Teuane Tominaga and his staff at the Department of Accounting and General Services; Mr. Francis Hatanaka, Mr. James Okamura and their staff at the Department of Education who contributed their invaluable assistance.

Sincerely,

ANBE, ARUGA & ISHIZU, ARCHITECTS, INC.

Takashi Anbe, A.I.A.
President

TA:HI:mi

FOREWORD

Much of the planning work for this complex development report was done during the March, 1970 - November, 1970 period when the design of the first increment was underway. The completion of the report, however, was delayed due to other more urgent projects requiring immediate attention and to help insure that the first increment will be completed as scheduled.

This report shows that the scheduled opening date of the school is September, 1973. However, to help relieve the overcrowded condition at Radford High School, it was decided that Moanalua High School should open in September, 1972. To accomplish this, the first increment was split into two phases with the first phase, Building M, to be completed by August, 1972, and the second phase, Building N and Building P, to be completed by August, 1973.

Phase I of the first increment was completed in time for the September, 1972 school opening. Phase II of the first increment and the second increment are now under design.

This report is published to document the planning process and decisions involved in master planning the school and to provide guidance for the implementation of the remaining increments.

TABLE OF CONTENTS

		Page
SECTION I - INTRODUCTION		
CHAPTER 1 - GENERAL		
1.1	Objective	1
1.2	Criteria	1
1.3	Methodology	1 - 2
CHAPTER 2 - SCHOOL PLAN		
2.1	Service Area	3
2.2	Feeder Complex	3
2.3	Enrollment Projections	5
2.4	Development Plan	5-6
SECTION II - PLANNING CRITERIA		
CHAPTER 3 - EDUCATIONAL SPECIFICATIONS		
3.1	General	9
3.2	Functional Relationship	9
3.3	Design Capacity	9
3.4	Classroom Requirements	9-10
3.5	Space Requirements	10
3.6	Covered Walks	10
3.7	Environmental Control	10
3.8	Carpeting and Movable Partitions	11
CHAPTER 4 - GOVERNMENT & UTILITY REGULATIONS		
4.1	General	13
4.2	State Regulations	13
4.3	County Regulations	13
4.4	Public Utility Regulations	13
CHAPTER 5 - SITE UTILIZATION SPECIFICATIONS		
5.1	Building Setback Line	14
5.2	Zoning	14
5.3	Multi-Story Building	14
5.4	Facility Placement	15
5.5	Facility Orientation	15
5.6	Access	15
5.7	Parking Stalls	16
5.8	Community Use	16
5.9	Aesthetics	17

TABLE OF CONTENTS

		Page
CHAPTER 6 - EVALUATION CRITERIA		
6.1	Functional Relationship	18
6.2	Site Utilization	18
6.3	Student Safety	18
6.4	Total Cost	18
SECTION III - PLANNING		
CHAPTER 7 - ALTERNATIVE PLANS		
7.1	Topography	19
7.2	Site Utilization	19
7.3	Alternative Site Plans	19
7.4	Evaluation and Selection	19-20
CHAPTER 8 - ULTIMATE PLANS		
8.1	Site Plan	26
8.1.1	Administration	26
8.1.2	Library	26
8.1.3	Gymnasium	26
8.1.4	Food Service	26
8.1.5	Auditorium	26
8.1.6	Lecture-Demonstration	26
8.1.7	Classroom Buildings	27
8.1.8	Vehicular Traffic	27
8.1.9	Pedestrian Traffic	27
8.2	Civil Plan	27-28
8.2.1	Roadway and Traffic	28
8.2.2	Grading and Drainage	28
8.2.3	Water System	28
8.2.4	Sewer System	29
8.2.5	Gas	29
8.3	Electrical Plan	29
8.3.1	Electrical System	28-30
8.3.2	Communications System	30
CHAPTER 9 - SPACE DATA		
9.1	One-Line Diagram	34
9.2	Space Requirements	34

TABLE OF CONTENTS

		Page
SECTION IV - SCHEDULING		
CHAPTER 10 - INTRODUCTION		
10.1	Increments	54
10.2	Program	54
10.3	Cost Factors	54-55
10.4	Time Factors	55
10.5	Latest Start Time	55
CHAPTER 11 - FIRST INCREMENT		
11.1	Facilities	57
11.2	Cost	57-61
11.3	Schedule	61
CHAPTER 12 - SECOND INCREMENT		
12.1	Facilities	64
12.2	Cost	64-67
12.3	Schedule	67
CHAPTER 13 - THIRD INCREMENT		
13.1	Facilities	69
13.2	Cost	69-72
13.3	Schedule	72
CHAPTER 14 - FOURTH INCREMENT		
14.1	Facilities	74
14.2	Cost	74-75
14.3	Schedule	75
CHAPTER 15 - FIFTH INCREMENT		
15.1	Facilities	77
15.2	Cost	77-78
15.3	Schedule	78
CHAPTER 16 - SIXTH INCREMENT		
16.1	Facilities	80
16.2	Cost	80-81
16.3	Schedule	81
CHAPTER 17 - SEVENTH INCREMENT		
17.1	Facilities	83
17.2	Cost	83-84
17.3	Schedule	84

TABLE OF CONTENTS

		Page
CHAPTER 18 - EIGHTH, NINTH & TENTH INCREMENTS		
18.1	Facilities	86
18.2	Cost	86
18.2.1	Eighth Increment	86-87
18.2.2	Ninth Increment	87-88
18.2.3	Tenth Increment	89
18.3	Schedule	90
CHAPTER 19 - BUDGETING		93

LIST OF ILLUSTRATIONS

Figure		Page
I	Vicinity Map	4
II	Proposed Feeder Complex Radford-Moanalua	7
III	Moanalua High Enrollment Phase In	8
IV	Functional Relationship Diagram	12
V	Master Plan Study A	21
VI	Master Plan Study B	22
VII-a - VII-c	Alternative Site Plan Evaluation	23-25
VIII	Ultimate Grading, Drainage, Water & Sewer Plan	31
IX	Ultimate Power & Communications Plan (Raceway)	32
X	Ultimate Power & Communications Plan (Circuiting)	33
XI	Ultimate Site Plan	35
XII	Building "F" - Music, Home Ec. & Art	36
XIII	Bldg. "G" - Business & Counseling	37
XIV	Bldg. "H" & "I" - Language & Social Studies & Science	38
XV	Bldg. "J" & "K" - Language	39
XVI	Bldg. "L" & "M" - Math & Science	40
XVII	Building "P" - Physical Education	41
XVIII	Building "Q" - Industrial & Agriculture Arts	42
XIX-a - XIX-g	Summary of Space Requirements Instructional Centers (By Buildings)	43-49
XX-a - XX-d	Summary of Space Requirements Supporting Centers (By Buildings)	50-53
XXI	Moanalua High School Incremental Development Schedule	56
XXII	Building Development, Power & Communications Plan - First Increment	62
XXIII	First Increment Grading, Drainage, Water & Sewer Plan	63
XXIV	Grading, Building Development, Power & Communications Plan - Second Increment	68
XXV	Grading, Building Development, Power & Communications Plan - Third Increment	73
XXVI	Building Development, Power & Communications Plan - Fourth Increment	76
XXVII	Grading, Building Development, Power & Communications Plan - Fifth Increment	79
XXVIII	Building Development, Power & Communications Plan - Sixth Increment	82
XXIX	Building Development, Power & Communications Plan - Seventh Increment	85
XXX	Building Development, Power & Communications Plan - Eighth Increment	91
XXXI	Building Development, Power & Communications Plan - Ninth & Tenth Increment	92
XXXII	Time Schedule	94

SECTION I - INTRODUCTION

CHAPTER 1 - GENERAL

1.1 Objective

The following are the objectives of this Complex Development Report:

A. Develop an ultimate plan which will best meet the educational program proposed for the Moanalua High School

B. Develop a sound incremental development plan to satisfy the interim requirements for the school until the ultimate plan is completed.

C. Determine the Capital Costs and prepare the budgeting program to implement the plan.

D. Publish a report for the Department of Accounting and General Services documenting the above items.

1.2 Criteria

This report was based on the requirements of the "Educational Specifications for Moanalua High School" which was prepared by the Planning Branch, Division of Public Works, Department of Accounting and General Services, in August, 1968, and later updated to conform to the "Educational Specifications and Standards for Facilities" published by the Department of Education in April, 1970. The Educational Specifications is a comprehensive document which provides basic information and direction in planning the school and is considered a counterpart of this report.

1.3 Methodology

To approach this assignment, a general background in school planning and design was established. Schools were visited and their program and facility organization analyzed. Expertise was drawn upon from the Department of Accounting and General Services and the Department of Education.

The objectives of this project were accomplished by undertaking the following general steps:

A. Review the Educational Specifications for Moanalua High School and other publications.

B. Review and summarize each program; the long and short-range operational requirements for each.

C. Establish program objectives for each building facility.

D. Analyze school site from the factors affecting incremental and ultimate plans.

E. Prepare and evaluate alternative site plans and elaborate on the alternative plan selected for the ultimate site plan.

F. Prepare one-line diagrams for all classroom buildings with summary of space requirements.

G. Prepare Ultimate Civil (Grading, Drainage, Sewer, Water and Gas) Plan and Ultimate Electrical (Power and Communications) Plan.

H. Prepare plans for incremental construction based on development schedule prepared by the Department of Accounting and General Services.

I. Determine Capital Costs for each increment and prepare budgeting program to implement the plan.

J. Publish a report documenting the pertinent items of the study, especially the ultimate and incremental plans and the budgeting program.

CHAPTER 2 - SCHOOL PLAN

2.1 Service Area

The proposed service area for the Moanalua Feeder Complex is roughly bounded by North Halawa Stream on the North, Middle Street and Kamehameha Highway on the South, Salt Lake Boulevard on the West and Koolau Range on the East. See Figure 1. This area comprises of approximately 30-40 percent of the School population in the eastern portion of the area now served by Radford High School. Eventually, the Moanalua service area will be increased to include up to 50 percent of the present Radford service area.

The proposed service area has taken a tremendous growth in the residential subdivisions. Some of these subdivisions are only partially developed and new dwelling units are constantly being built. With the continued growth in these residential development, increasing pressure for a new high school has been placed in the service area. Present residential developments in this area are:

Red Hill Development
Moanalua Terrace
Moanalua Valley
Moanalua Gardens
Lakeside

Future residential development as projected, shows approximately 1600 military quarters and 2600 civilian housing units in the next 8-10 years.

2.2 Feeder Complex

The Radford Feeder Complex consisting of one high, two intermediate and eleven elementary schools, now serves the Radford-Moanalua area. This Complex will be divided into the Moanalua and Radford Complexes when Moanalua High School is constructed.

The existing schools in the proposed Moanalua Feeder Complex will be Red Hill, Shafter, Moanalua, Aliamanu and Nimitz Elementary Schools plus Moanalua Intermediate. Salt Lake Elementary School students in the Radford Feeder will attend Aliamanu Intermediate and later attend Moanalua High, thus dividing the service area of Radford High School as shown on the proposed organizational structure of Radford-Moanalua in Figure II.

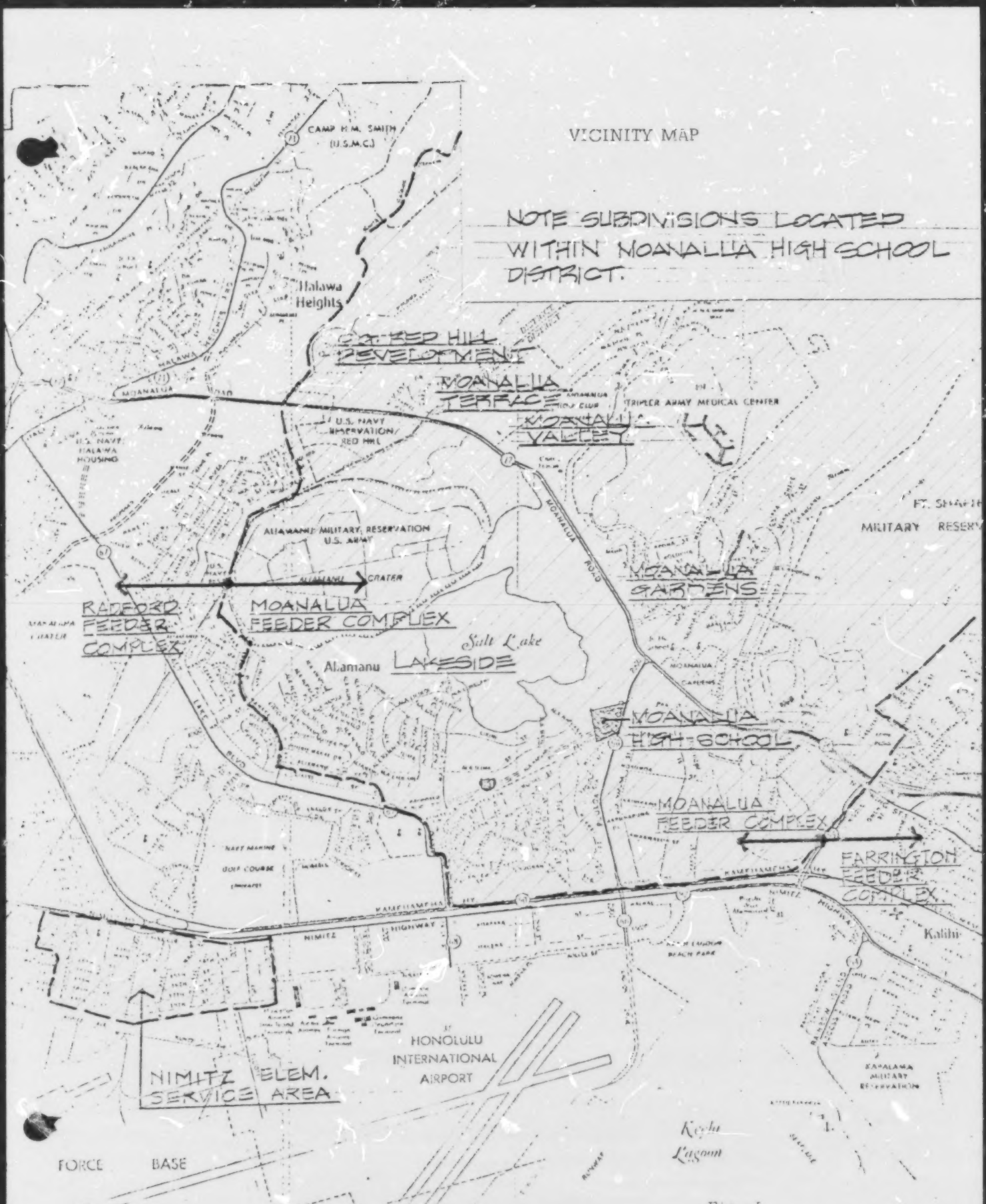

VICINITY MAP
NOTE SUBDIVISIONS LOCATED WITHIN MOANALUA HIGH SCHOOL DISTRICT.
CAMP H.M. SMITH (U.S.M.C.)
Halawa Heights
CATTLED HILL DEVELOPMENT
MOANALUA TERRACE
MOANALUA VALLEY
TRIPLER ARMY MEDICAL CENTER
U.S. NAVY RESERVATION/ RED HILL
U.S. NAVY HALAWA HOUSING
MOANALUA ROAD
ALIAMANU MILITARY RESERVATION U.S. ARMY
ALIAMANU CRATER
RADFORD FEEDER COMPLEX
MOANALUA FEEDER COMPLEX
Salt Lake
Aliamanu
LAKESIDE
MOANALUA GARDENS
MOANALUA HIGH SCHOOL
MOANALUA FEEDER COMPLEX
FARRINGTON FEEDER COMPLEX
NAVY MARINE GOLF COURSE
NIMITZ HIGHWAY
KAMEHAMEHA HWY
Kalihi
HONOLULU INTERNATIONAL AIRPORT
NIMITZ ELEM. SERVICE AREA
KAPALAMA MILITARY RESERVATION
Keehi Lagoon
FORCE BASE

Fig. I

2.3 Enrollment Projections

To obtain a manageable level at Radford High School, the "overflow" will enroll in this new high school. The Grade 9-12 long-range enrollment estimates for the Radford-Moanalua Service Area indicated below are based on the following:

A. School year 1970-71
B. Updated information regarding military and civilian housing construction.

School	1971	1977	1980	1985	1990
Radford High	3132	2880	2300	2350	2400
Moanalua High	-	1597	2300	2350	2400

These enrollment projections are updated periodically by the Department of Education.

2.4 Development Plan

In any incremental scheduling, a development schedule is necessary to insure maximum economy and minimum disturbance regarding priority, financing, construction sequences and noise. Equally important is the phase-in service for the school. Tentatively, Moanalua High School phase-in service is planned in two phases as indicated in Figure III.

A. Phase I (1972) includes the service areas of elementary schools that now feed into Moanalua Intermediate plus the Salt Lake Elementary service area which feeds into Aliamanu Intermediate.

B. Phase II (1975) will add enrollment from the Nimitz Elementary service area. The 1975 data is subject to several major considerations including:

   1. Whether 581 military quarters planned for the Tripler Hospital area will be constructed as planned; and

   2. Whether there will be significant return to Moanalua High School of approximately 250 students who now attend Farrington High School.

C. Between 1977 and 1980, a third phase shift may be required from Radford High to Moanalua High; permitting Radford enrollment to drop to a level no higher than 2200 - 2400 students. If this projection becomes a reality, this phasing will involve changing the Moanalua High service area to add another elementary school service area in Hickam Air Force Base.

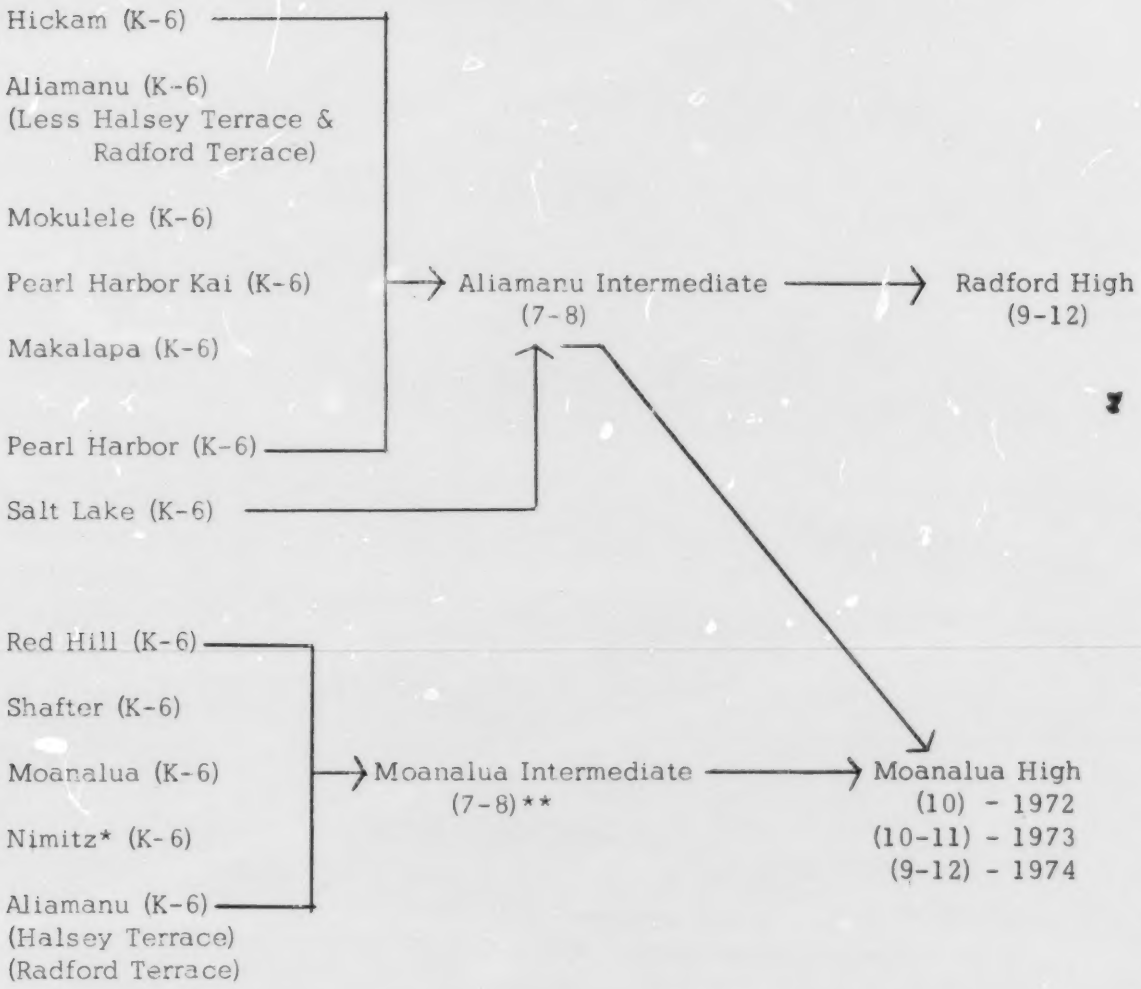
The first and second increments scope of work have been scheduled to assure completion of forty-two (42) classrooms by 1974 to handle Phase I of the phase-in service.

The third and fourth increments scope of work will accommodate Phase II of the phase-in service totalling sixty-four (64) classrooms by 1977. The sixty-four classrooms should be adequate to handle the Phase III shift from Radford between 1977- 1980.

The fifth through seventh increments scope of work includes the supportive centers, with buildings being completed by 1979.

Subsequent incremental development will be coordinated with expected enrollment with the ultimate of 103 classrooms for 3,000 students. Estimated enrollment of 1,597 students is anticipated by 1977-78 school year.

PROPOSED
FEEDER COMPLEX
RADFORD-MOANALUA



* (1) Becomes feeder to Aliamanu Intermediate in 1974.
(2) Service Area becomes feeder to Moanalua High in 1975.

** Moanalua Intermediate drops grade 9 in 1974

Figure II

MOANALUA HIGH
ENROLLMENT PHASE IN

School Year	Phase	Enrollment	Grades	Total Classrooms	Capacity
1972	I	296	10	18	504
1973		569	10 - 11	22	616
1974		1187	9 - 12	44	1232
1975	II	1333	9 - 12	55	1540
1976		1497	9 - 12	66	1848
1977		1597	9 - 12	66	1876

Phase I - Service Area: Red Hill Elem., Moanalua Elem., Shafter Elem., Salt Lake Elem., Halsey Terrace, Radford Terrace

Phase II - Service Area: Adm. Nimitz Elem.

1975 - 9th grade plus new residents grades 10-12
1976 - 9th and 10th grade plus new residents grades 11-12
1977 - 9th-11th grade plus new residents grade 12

Figure III

CHAPTER 3 - EDUCATIONAL SPECIFICATIONS

3.1 General

The Educational Specifications for Moanalua High School was prepared by the Planning Branch, Division of Public Works, Department of Accounting and General Services and updated according to the Department of Education's Educational Specifications and Standards for Facilities.

The Specification is a comprehensive document which provides the basic criteria for development of the Complex Development Plan. The reader is referred to the above specification for descriptions of the various educational programs and how the facilities support these programs. Portions of the specifications are duplicated herein only where warranted for the reader's convenience.

3.2 Functional Relationship

The Functional Relationship Diagram shown in Figure IV is a modified diagram translated from the Moanalua High School Educational Specifications. This diagram reflects the ideal arrangement of facilities desired by the Department of Education to implement the educational program. The Alternative Site Plans prepared for this project are the results of the Architect's interpretation of the diagram into a functional relationship of facilities.

3.3 Design Capacity

The Department of Education has set a design capacity for the High School at 3,000 students, Grades 9-12.

3.4 Classroom Requirements

The ultimate number and types of classrooms required for the new school were extracted from the Moanalua High Educational Specification and are summarized as follows:

SUBJECT	ENROLLMENT	ROOMS
English & Speech	3,300	23
Foreign Language	1,200	8
Social Studies	3,300	17
Mathematics	2,520	14
Science	2,160	10

SUBJECT	ENROLLMENT	ROOMS
Art	360	3
Vocal-Music	480	1
Instrumental-Music	480	1
Typing	960	4
Business	900	6
Home Economics	360	3
Industrial Arts	900	7
Agricultural Arts	180	1
P.E./Health	960	4
Student Gov't		1
		103

Some specialized classrooms such as those in the Science and Mathematic Building are functionally versatile and therefore, are included in the early phases of development. These specialized classrooms can be used for regular classrooms but is difficult to use a regular classroom in place of a special one. Therefore, interim classroom requirements are not elaborated here. Many of the classrooms are generally the same and can adequately serve more than one subject.

3.5 Space Requirements

The space requirements for the facilities are summarized in Chapter 9, One-line diagram. These space requirements are in accordance with the various buildings provided in the Ultimate Site Plan.

3.6 Covered Walks

Criterion for justification of covered walks has been established by the Department of Education. Schools with median annual rainfall of 45 inches and over qualify for covered walks. Moanalua High School falls short of this requirement and does not qualify for covered walks.

3.7 Environmental Control

According to the Board of Education's policy on environmental control, the following facilities will be air conditioned:

A. Library
B. Music Department

The remainder of the school shall be so designed to take maximum possible advantage of natural ventilation.

3.8 Carpeting and Movable Partitions

The Library will be carpeted according to the Educational Specifications for Moanalua High School. If budget is limited, other covering material of noise reducing quality which is easily cleaned and attractive should be used.

Movable partitions may be provided in classroom areas to provide for additional flexibility to meet the ever changing educational practices. The locations of these movable partitions are shown on the one-line diagram in Chapter 9.

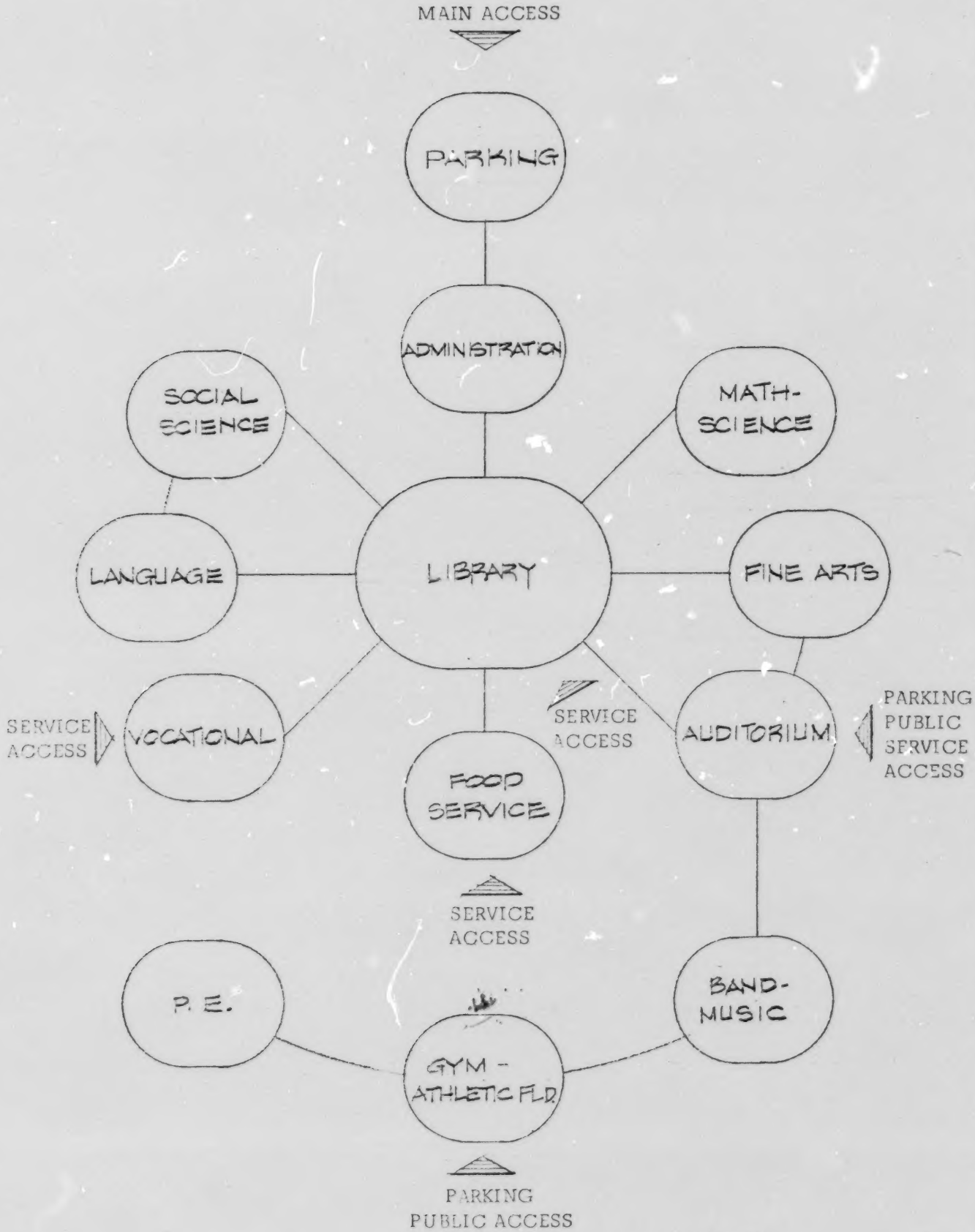


Fig. IV
Page 12

FUNCTIONAL RELATIONSHIP DIAGRAM

CHAPTER 4 - GOVERNMENT & UTILITY REGULATIONS

4.1 General

To provide for the safety of students, teachers, as well as the public, this Master Plan strives to conform to all regulations of the utility companies, and State and County governments. Conformance to the government and utility companies regulations is also made at each incremental development stage.

4.2 State Regulations

The major State regulations affecting this report are those of the Department of Health. Basically, these regulations concern the toilet facilities for various educational programs and facilities affecting environmental control.

Spaces for faculty toilets and lounges are provided as specified in the Educational Specifications. Spaces for student toilets are provided as required by the Health regulations and as specified in the Educational Specifications.

4.3 County Regulations

In preparing the Alternative Site Plans, the following City and County regulations were complied with:

A. Comprehensive Zoning Code.
B. Building Code.
C. Plumbing Code.
D. Electrical Code.
E. Subdivision Rules and Regulations.
F. Grading Standards.
G. Drainage Standards.
H. Board of Water Supply Standards.

The school property is zoned Residential R-4, under the City and County Detailed Land Use Map. All requirements of the Comprehensive Zoning Code are based on this zoning and all requirements of the Building Code are based on Fire Zone III.

4.4 Public Utility Regulations

Applicable sections of the regulations of Hawaiian Electric Company, Hawaiian Telephone Company, and GASCO, Inc. have been conformed with.

CHAPTER 5 - SITE UTILIZATION SPECIFICATIONS

5.1 Building Setback Line

The Ultimate Site Plan, Figure XI shows the total area of 30.433 acres composed of the following segments:

30.089	Acres Ultimate School Site
0.344	Acres Future Right-of-Way - State Highways
30.433	Acres Total

The building setback line has been established at the future property line of the school site.

5.2 Zoning

The school site designated by tax map key 1-1-63: 11 has been zoned R-4 by the City and County. The minimum yard requirements, assuming frontage along the south side to be the front yard, are 30 feet for the front yard and 15 feet for the side yards for building up to 15 feet. For each 2 feet of additional height there shall be an additional yard setback of 1 foot.

Bleachers are considered as structure and must comply with the minimum yard and height requirements. The football bleachers along the north property line encroaches the height requirement and an application for a waiver must be filed with the City & County.

5.3 Multi-Story Building

Under the present "Educational Specifications and Standards for Facilities" published by the Department of Education, usable acreage requirements for high school is 2.0 acre per 100 students. Based on this design standard, 60 acres will be required for Moanalua High School with the ultimate student enrollment of 3,000.

Since the Ultimate School Site is 29.911 acres below present standards, the site must be utilized as fully as economically feasible by taking advantage of the hilly site wherever possible. Multi-Story Classroom Buildings are planned to assure adequate areas for parking, athletic facilities and supportive centers.

5.4 Facility Placement

In striving to prepare alternative site plans based on the Functional Relationship Diagram in Figure IV, many factors required compromises to achieve a good economical master plan.

The physical characteristic of the site and the preservation of views, were contributing factors in the placement of the facilities.

Parking areas were located in two areas which helped to eliminate the usual massive sea of cars at one location.

The major traffic noise generators are Moanalua Road and Puuloa Road. The natural topography of the site raises the school high enough above these two major arterials to minimize the noise problem. The Athletic Fields, Gymnasium, Pool, Physical Education Center and Music Center are the major internal noise generators. These are located as far out and downwind as possible from instructional centers.

5.5 Facility Orientation

The facilities in general were situated parallel to the natural contours of the site to maintain best possible circulation patterns and economical construction features.

In keeping with current State policies, air conditioning systems are provided in the Library and the Music Department. The remaining facilities will rely on natural ventilation and were positioned for utilization of the tradewinds and corridors were planned for the traditional single loading.

The instructional centers were positioned for maximum inter-communication to allow for sharing of facilities.

5.6 Access

The School Site is bounded by Puuloa Road on the East, Peltier Avenue on the South and residential sites on the West and North.

Moanalua Road, a major traffic route, lies about $\frac{1}{4}$ mile mauka of the school site. Access from this arterial is by way of Puuloa Road, then Peltier Avenue, then Ala Napunani Street. The initial entrance will later become the service road; keeping vehicular penetration into the campus at extreme ends of Ala Napunani Street.

5.7 Parking Stalls

The parking requirements of the Comprehensive Zoning Code is based on 5 stalls per classroom or one stall for each 5 seats in the main auditorium whichever is greater. The minimum dimension of the stall is $8\frac{1}{2}$ by 19 feet with aisle space of 25 feet for 90 degree parking angle.

The ultimate parking space for the high school is 515 stalls. Parking is planned to provide adequate spaces at each incremental stage to meet the CZC requirement.

	163 Stalls	1st Increment
	62 Stalls	2nd Increment
	110 Stalls	3rd Increment
	48 Stalls	5th Increment
	132 Stalls	8th Increment
Total	515 Stalls	

Parking areas are provided off of the main and service drives at the periphery of the instructional and supportive centers.

5.8 Community Use

"Lacking any commercial development or government center in this area, the High School will be the focal point of community activity and pride."*

Realizing the lack of community facilities in this area, and realizing the use of various school facilities by the community, the Architect tried to show the location of the following facilities readily accessible to the community:

A. Baseball Field
B. Football and Track Field
C. Swimming Pool
D. Paved Playcourts
E. Gymnasium
F. Auditorium
G. Lecture - Demonstration
H. Food Facilities

It must be realized, however, that community requirements for these facilities are secondary to the educational requirements for the school.

* Page 8 - Educational Specifications for Moanalua High School.

5.9 Aesthetics

It has been a challenge to compose a master plan to meet all of the educational requirements and governmental requlations and still be aesthetically pleasing to the students and community when completed.

With the site being very hilly, the campus plan created many changes of level. The definition of the plazas and courts are reinforced with many changing views and a variety of areas for intimate as well as large group congregation.

The plan provides a commanding view of Salt Lake and also of the ocean and Diamond Head from various parts of the campus. Another important aspect in the planning is that hillside residents will be constantly in view of the campus.

CHAPTER 6 - EVALUATION CRITERIA

6.1 Functional Relationship

The two alternative site plans, Figures V and VI, submitted by the Architect meet all the requirements of Chapters 3 and 4 with the exception of the functional relationship. The Architect has tried to represent in the alternative site plans the ideal relationship of facilities, as indicated and as near as possible to the Functional Diagram, Figure IV.

6.2 Site Utilization

Further evaluation of each alternative site plan is based on Chapter 5, Site Utilization Specifications. The following is the order of importance of each item:

A. Facility Placement
B. Facility Orientation
C. Access and Parking
D. Community Use
E. Aesthetics

6.3 Student Safety

Student safety cannot be disregarded even though it may seem of only minor importance. Basically, student safety refers to the separation of pedestrian and vehicular traffic, and minimizing their crossing. It also refers to vehicular and truck traffic into, on, and out from the school site.

6.4 Total Cost

In evaluating each alternative site plan, the cost of the facilities is generally the same. The major difference in the total cost is usually due to site work and utilities. While definite cost analysis is not made to support the cost evaluation, general analysis is made based on present engineering and economic knowledge.

SECTION III - PLANNING

CHAPTER 7 - ALTERNATIVE PLANS

7.1 Topography

The school site, shown in Figure XI, occupies 30.089 acres of the ridgetop area bounded by Puuloa Road on the East, Peltier Avenue on the South and residential sites on the West and North. Elevation varies from 18 to 120 feet with the high areas in the center east end, and the low areas on the north and south boundaries. Slope varies throughout the site with two flat areas along the west boundaries.

The 30.089 acres of the school site are covered by brush with no major improvements to the site except for Ala Napunani Street.

7.2 Site Utilization

Basic site utilization considerations are necessary to establish general function zones because of the following items:

A. Unusual dimensions of the property.
B. Unusual topography of the site.
C. Large space requirements for athletic facilities.
D. Large space requirements for vehicular access and parking.

The two major divisions of the intra-zoning study are the academic and the physical education areas. Using applicable items from the Functional Relationship Diagram in Chapter 3, Site Utilization Specifications in Chapter 5, and Evaluation Criteria in Chapter 6, general schemes were made. The results are shown on the two alternative site plans, Figures V and VI and discussed below:

7.3 Alternative Site Plans

Early study of the space re[illegible]ements, functional relationships and physical aspects of the site resulted in two basic schemes which were submitted to the Department of Accounting and General Services and the Department of Education.

7.4 Evaluation and Selection

Both plans for Moanalua High School provide for an attractive, functional grouping of buildings and open spaces. Plan "A" provides for a more compact, tightly integrated, and urbane grouping on the ridge, overlooking Salt Lake on one side and downtown Honolulu on the other, with athletic

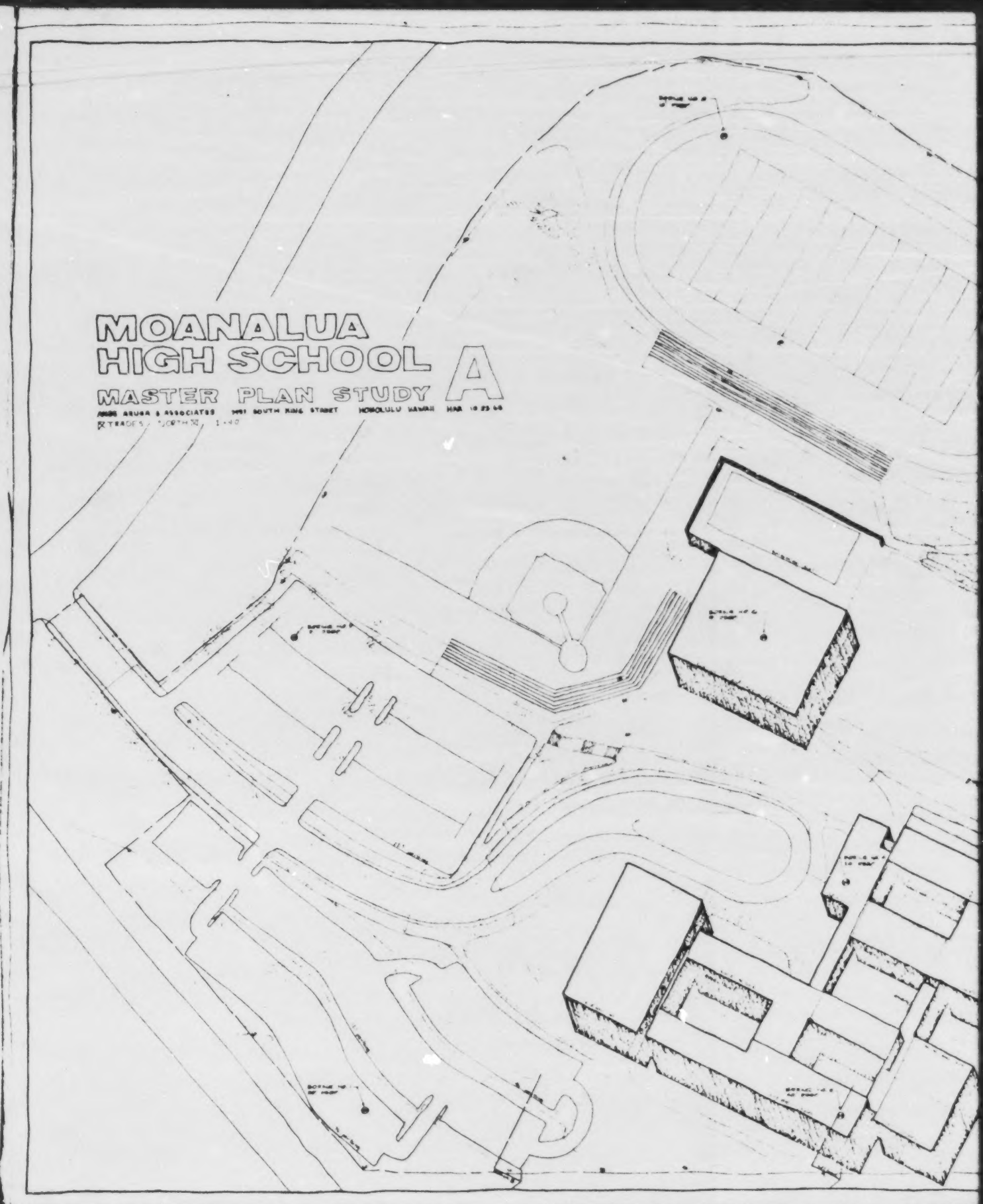
facilities and parking downslope. Plan "B" provides for a more formal organization of buildings around the two general foci-quiet functions on the ridge, more noisy facilities downslope.

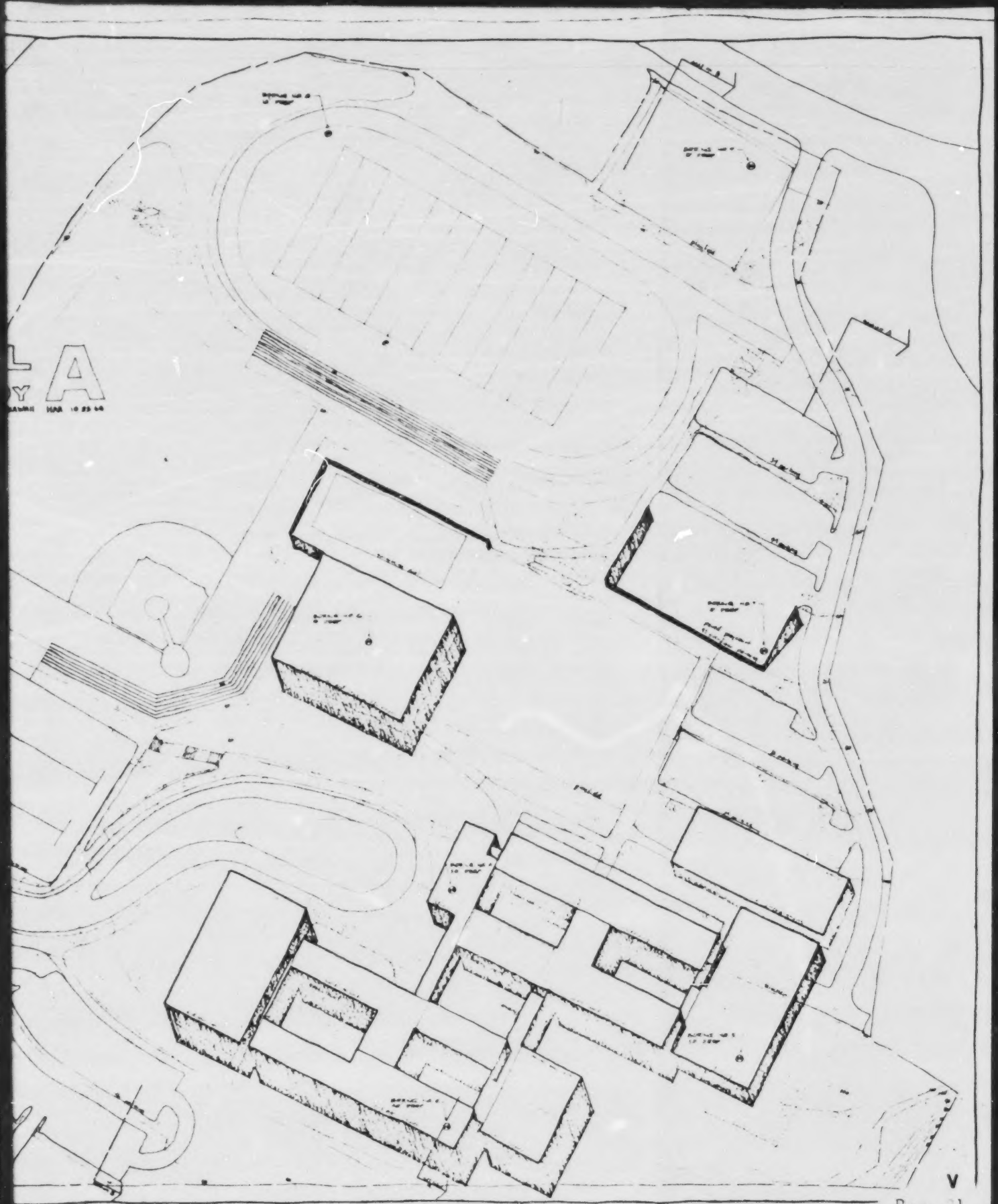
School "A" is inward looking-focusing activity on four interior courtyards. The Library occupies the center of the complex, surrounded by successive layers of classrooms, support functions, and athletic and parking facilities. This compact organization permits a high degree of control of circulation and future development. Other particular advantages are the concentration of landscaping into a few areas and the close proximity of academic departments facilitating sharing of rooms and permitting greater scheduling flexibility.

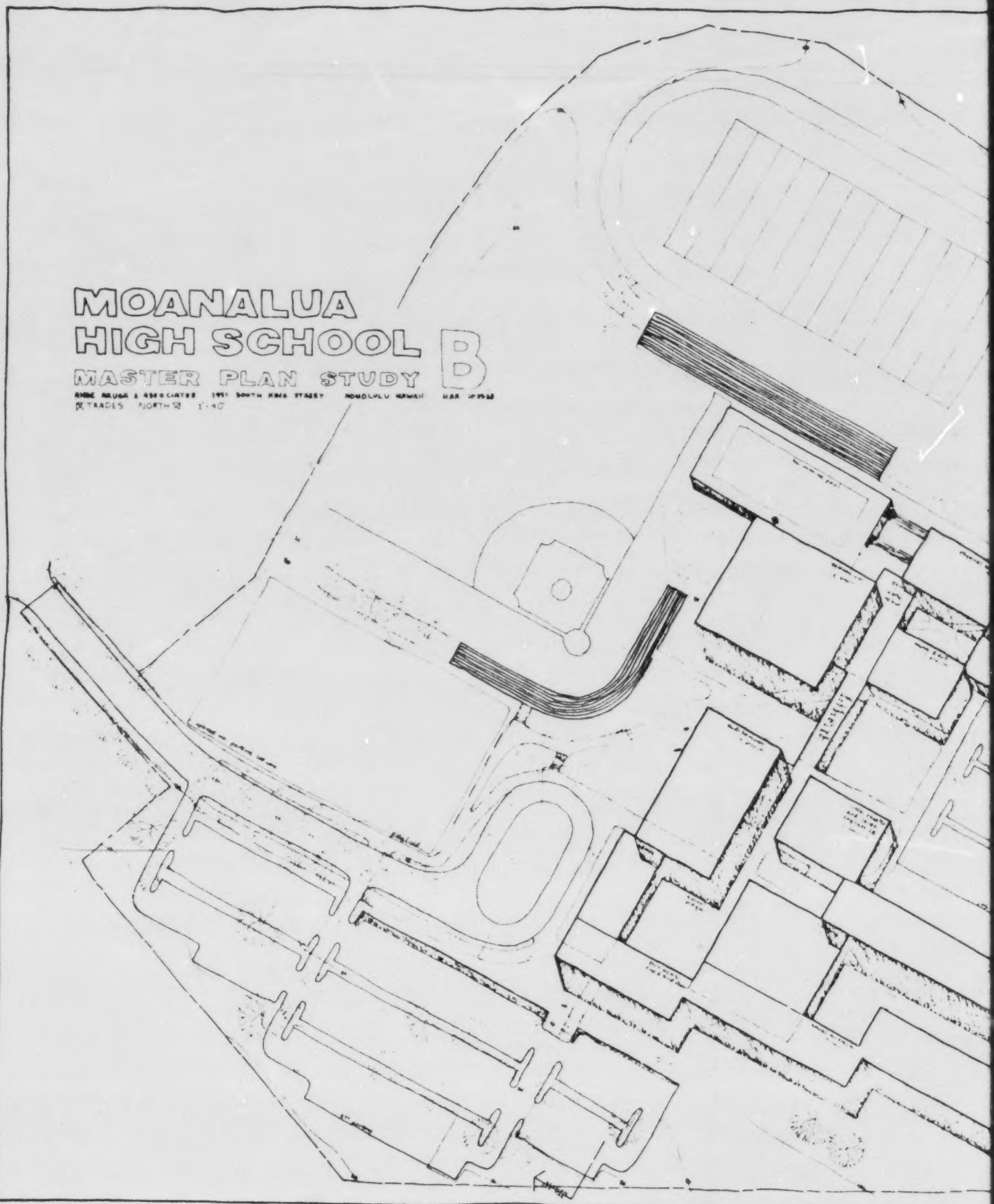
School "B" opens up to the view and prevailing breezes. A variety of informal and formal spaces are formed between the buildings. The less formal organization permits the segregation of noisy activities from the library/academic center, although, as in Plan "A", the library remains at the center of activity. The more spread-out plan permits parking to be closer to the buildings and could accommodate major alternations in the development plan.

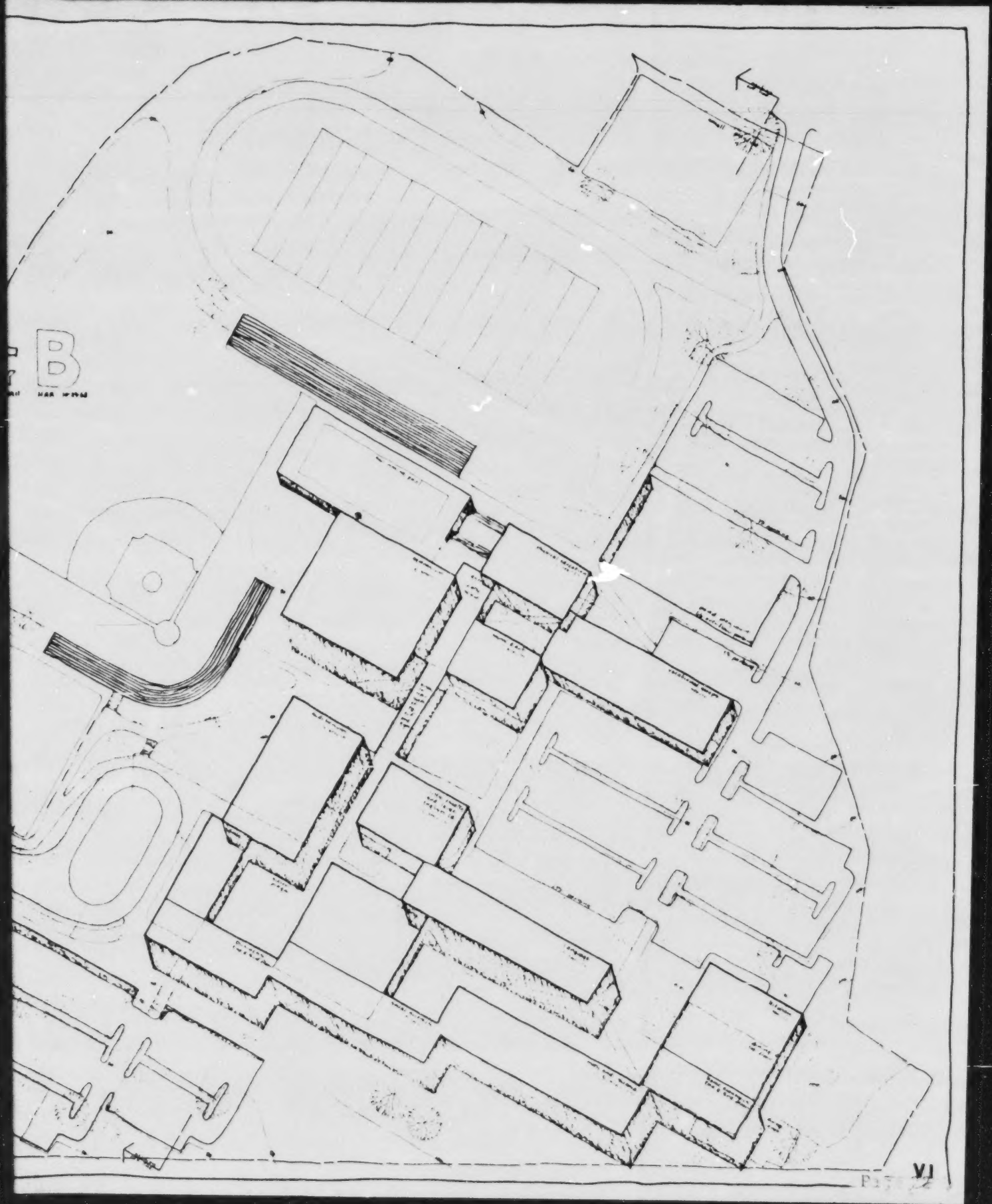
The similarities and differences between the two plans are summarized in the accompanying chart, Figures VII.

The selection of Scheme "B" for further development was based on the evaluation chart. In general, Scheme "B" provide better natural ventilation, better separation of noisy areas, better views and less disturbances of construction.


MOANALUA
HIGH SCHOOL
A
MASTER PLAN STUDY
AMOS ARUGA & ASSOCIATES 1001 SOUTH KING STREET HONOLULU HAWAII HAR 10 23 68
EXTRADES / NORTH 32 1-40




MOANALUA
HIGH SCHOOL B
MASTER PLAN STUDY
TRADES NORTH 1:40


B

ALTERNATIVE SITE PLAN EVALUATION

Factor	Both Plans	Plan A	Plan B
Library	Centrally located		Better views
Fine Arts Center		Nearer library	Nearer athletic, better truck access
Vocational Center	Shops separated	More integrated with other fac.	
Administration	At formal entrance	2 story	1 story
Dining/Kitchen	Similar location		Better ventilation and views.
Auditorium	Good public access		Better Integrated
Athletic Facilities	Similar location, poor vehicle access	More compact organization	Closer to parking
Playfield Area	Similar, inadequate	1- 200' x 275', 1- 125' x 175'	1- 180' x 300', 1- 125' x 175'
Parking	CZC standard, 600+ spaces	Better access from main roads	Less congestion
Drop-off area	Formal		More compact
Service access	Awkward due to topography	Difficult for music and gym	Somewhat indirect for kitchen
Circulation between classes	Reasonably compact	750' maximum, rain-protected except to physical education	900' maximum, less rain protection
Access from parking	Considerable climb	450' average to buildings	250' average to buildings

Figure VII-a

Factor	Both Plans	Plan A	Plan B
Land use efficiency	Similar, limited by topography		
Grading required	Extensive		
Landscaping		Few highly developed areas	More, "natural" landscaping
Courtyards	Buildings form courtyards	Better expression of educational concept	Greater variety
Flexibility		Easier sharing of facilities	Adapts to major plan changes
Phasing		Better control of later phases	Less disturbance by construction
Ventilation	Adequate		Somewhat better
Noise transfer	Acceptable		More separation of noisy areas
Use by handicapped	Access to all major facilities and departments, but not all spaces	Easier movement between facilities	
Cost	Similar		
Massing and appearance	Predominantly 3 stories, major mass located for maximum visibility	More formal.	More spread out.

Figure VII-b

Factor	Both Plans	Plan A	Plan B
Views outward	Located to get 360° view		Better use of view
Problems (misc.)	Hilly topography	Phasing of athletic building	No spectator seating for pool
Other Features		Better entry to complex	Better approach to complex

Figure VII-c

CHAPTER 8 - ULTIMATE PLANS

8.1 Site Plan

8.1.1 Administration

The Administration Building is at the main entrance to the school as recommended and the nearby parking area will make it accessible to the student body as well as to the community.

8.1.2 Library

The Library sits in the middle of the largest and most central court and thus physically fulfills its role as nucleus of the instructional center.

8.1.3 Gymnasium

The Gymnasium and its supporting facilities and play field areas are on the fringe of the school complex and are accessible from the entrance drive as well as the service drive where it can be reached easily by large spectator crowds. The Gymnasium sits in the center of the athletic complex thus athletic activities can be controlled from its lobby.

8.1.4 Food Service

The Food Service Building sits at the end of the service drive for easy serviceability. It juts out from the rest of the school for a tremendous view of Honolulu and Diamond Head. The court in front of the dining room provides ample space for socializing and leisure during the noon hour.

8.1.5 Auditorium

The Auditorium sits opposite the Library separated by a large court. It has been placed close to a large parking area to accommodate large spectator crowds.

8.1.6 Lecture-Demonstration

The Lecture-Demonstration Building sits with the Library, Auditorium and Administration Buildings around a large court.

8.1.7 Classroom Buildings

The Classroom Building reflect the teacher-station system to permit better flexibility and more efficient use of classroom facilities. The teacher's workroom and resource centers will facilitate closer coordination of instructional programs.

Students will be furnished with individual lockers in decentralized sheltered locations for maximum convenience to students and minimum congestion.

Drinking fountains will be located throughout the campus for best use by student and faculty.

The three-story classroom buildings will be connected by a horizontal "freeway" at the second floor to minimize congestion when changing classes.

The "freeways" will also serve as covered walkways for the first floor; an advantage during inclement weather since this school does not meet the requirement for covered walkways as stated previously.

8.1.8 Vehicular Traffic

The vehicular circulation, parking, and service are discussed in Section 8.2 - Civil Plan. On occasions, direct vehicular access to certain structures can be accomplished by driving on walkways and grassed areas.

8.1.9 Pedestrian Traffic

Pedestrian will find many stairs to go up and down. This was unavoidable because of the hilly site. But the change in levels reinforces the definition of the plazas and courts, and provides many changing views and a variety of areas for intimate as well as large group congregations. Ramps are provided where necessary for easier handling of equipment and supplies, as well as for use by physically handicapped students.

8.2 Civil Plan

The ultimate civil plan shown in Figure VIII, included provisions for the following facilities:

1. Roadway and traffic
2. Grading and drainage
3. Water and sewer system
4. Gas

These facilities have been arranged and programmed to support the incremental development plan and to permit orderly implementation.

8.2.1 Roadway and Traffic

The roadways to the campus are located on Ala Napunani Street at the extreme ends of the site. The service road will be constructed in the first increment followed by the main access road in the second increment.

From the service road, parking spaces for 163 cars are provided. Additional parking spaces are provided off from the main access road at the entry to the campus. With the split parking system, traffic would be less congested.

Drop curb driveway is provided for the service access road. The main access road will tie into the existing curb returns; thus providing faster traffic movement at the main entrance to the school.

8.2.2 Grading and Drainage

The site being very hilly, the grading will generally consist of terracing the building, parking lot, and athletic field areas plus grading for the roadways. Excess excavation from the property will be used to level off low spots and fill the parking lot at the main access road. The cut and fill quantities of the soil are well balanced throughout the incremental stages that minimum importing or exporting of soil material is anticipated.

8.2.3 Water System

The school's water supply is from Ala Napunani Street, where a meter shall be installed. To meet the City & County minimum backflow prevention requirement, an approved 8-inch double check valve assembly on the main property pipe and a 4-inch reduced pressure principle backflow prevention device shall be installed. These backflow prevention devices shall be installed above ground at locations having adequate drainage.

The water pressure at the meter location is approximately 45psi. A booster system will be required to provide adequate water pressure for most of the buildings. Losses of pressure through the backflow prevention devices shall be considered in designing the booster system.

At the request of the Department of Accounting and General Services, two fire hydrants will be provided for added fire protection.

8.2.4 Sewer System

The school sewer connection shall be made to the existing sewer line on Ala Napunani Street.

8.2.5 Gas

Gas will be provided to the following facilities as required:

(1) Cafetorium
(2) Science Classroom
(3) Homemaking Classroom
(4) Arts and Crafts Classroom
(5) Shop Building

Appropriate size of gas lines will be utilized throughout the campus inside and/or outside of the buildings.

8.3 Electrical Plan

The ultimate electrical plans consist of the Ultimate Power and Communications Plan shown in Figure IX and the Single Line Electrical Diagram shown in Figure X. These facilities have been arranged and programmed to permit their orderly implementation in support of the incremental development plan at minimum cost.

8.3.1 Electrical System

The ultimate electrical power requirement estimated for the school is 1500 KVA. Service will be from the Hawaiian Electric Company at 12.47 KV, 3 phase, through pad mounted transformer and transformer vault. The utility company will transform the power to 480 Y/277 volts, 3 phase, 4 wires. The power will be metered for billing under retail schedules "A" and "C", and controlled at a main metering and switching vault.

The metering and switching vault will be housed in the Utilities Building. All equipment will be totally metal enclosed and in accordance with NEMA Specifications. Distribution to the various buildings will be 480 Y/277 volts by underground circuits. All circuits will be copper conductored, plastic insulated and enclosed in concrete encased PVC or asbestos cement conduits.

Lights outside the buildings will be provided as follows:

(1) Flood lights for athletic fields.
(2) Flood lights for parking lots.
(3) Flood lights and night lights for buildings.

These lights shall be designed to provide adequate lighting along the main drive and service road for night events at the school.

8.3.2 Communications System

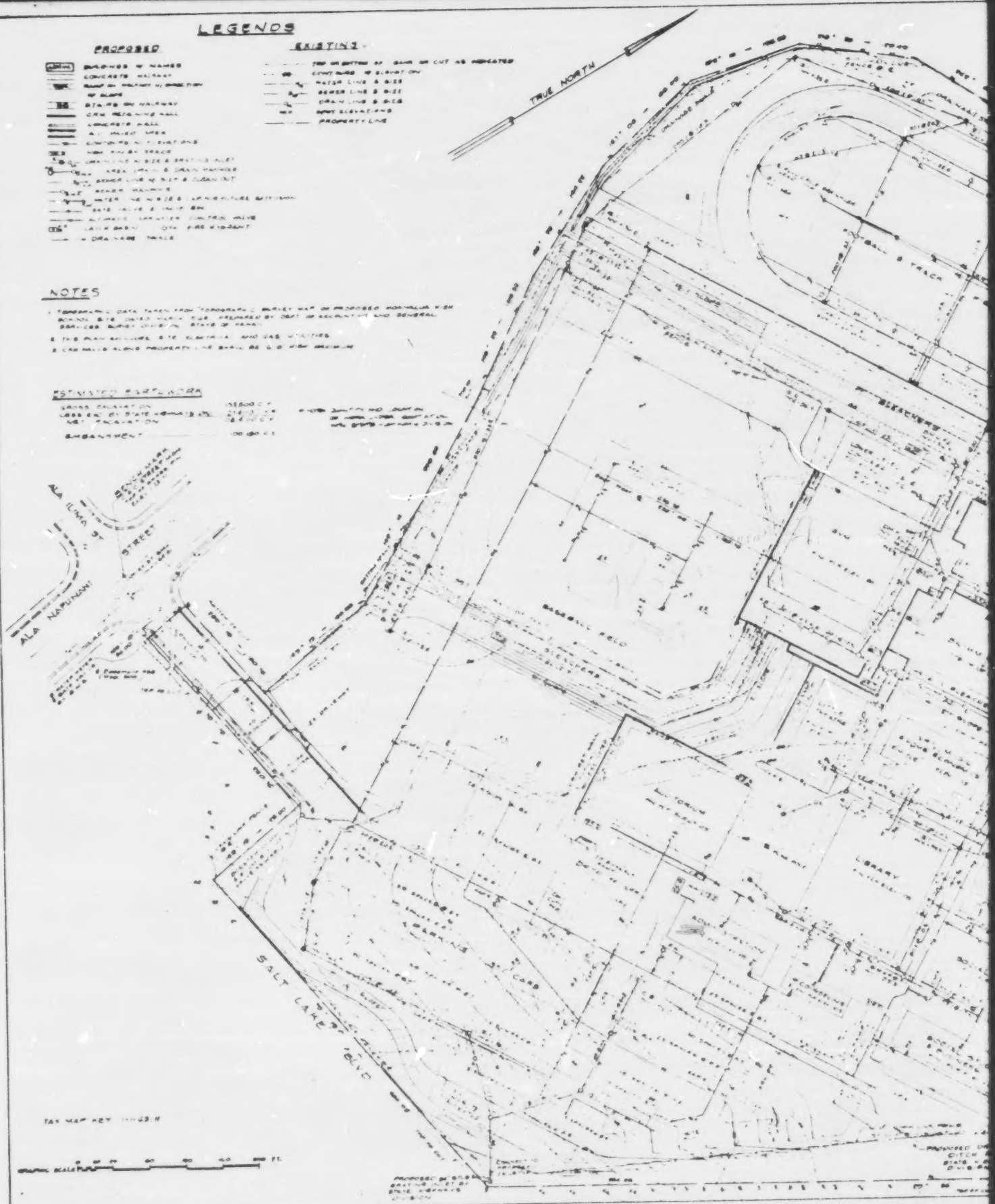
The communications system will include the fire alarm, clock and program control, telephone and campus communications facilities as follows:

(1) Fire alarm system will consist of manual alarm reporting stations, alarm sounding bells, annunciator to indicate location of alarm and the control panel.

(2) Clock and program control system will consist of synchronized clocks and signalling bells with signals transmitted over a wired network.

(3) Telephone system will consist of empty raceways provided in accordance with Hawaiian Telephone Company's instructions.

(4) Campus communications will consist of empty raceways for public address system, educational T.V. system, intercom system, etc.


LEGENDS
PROPOSED
EXISTING
NOTES
TRUE NORTH
ALA NAPUNANI
STREET
SALT LAKE BLVD
LIBRARY
MOANALUA HIGH SCHOOL
MOANALUA, OAHU, HAWAII
ULTIMATE GRADING, DRAINAGE, WATER

ULTIMATE GRADING, DRAINAGE, WATER & SEWER PLAN

ANDE ARUGA AND ASSOCIATES, INC ARCHITECTS

VIII

MOANALUA HIGH SCHOOL

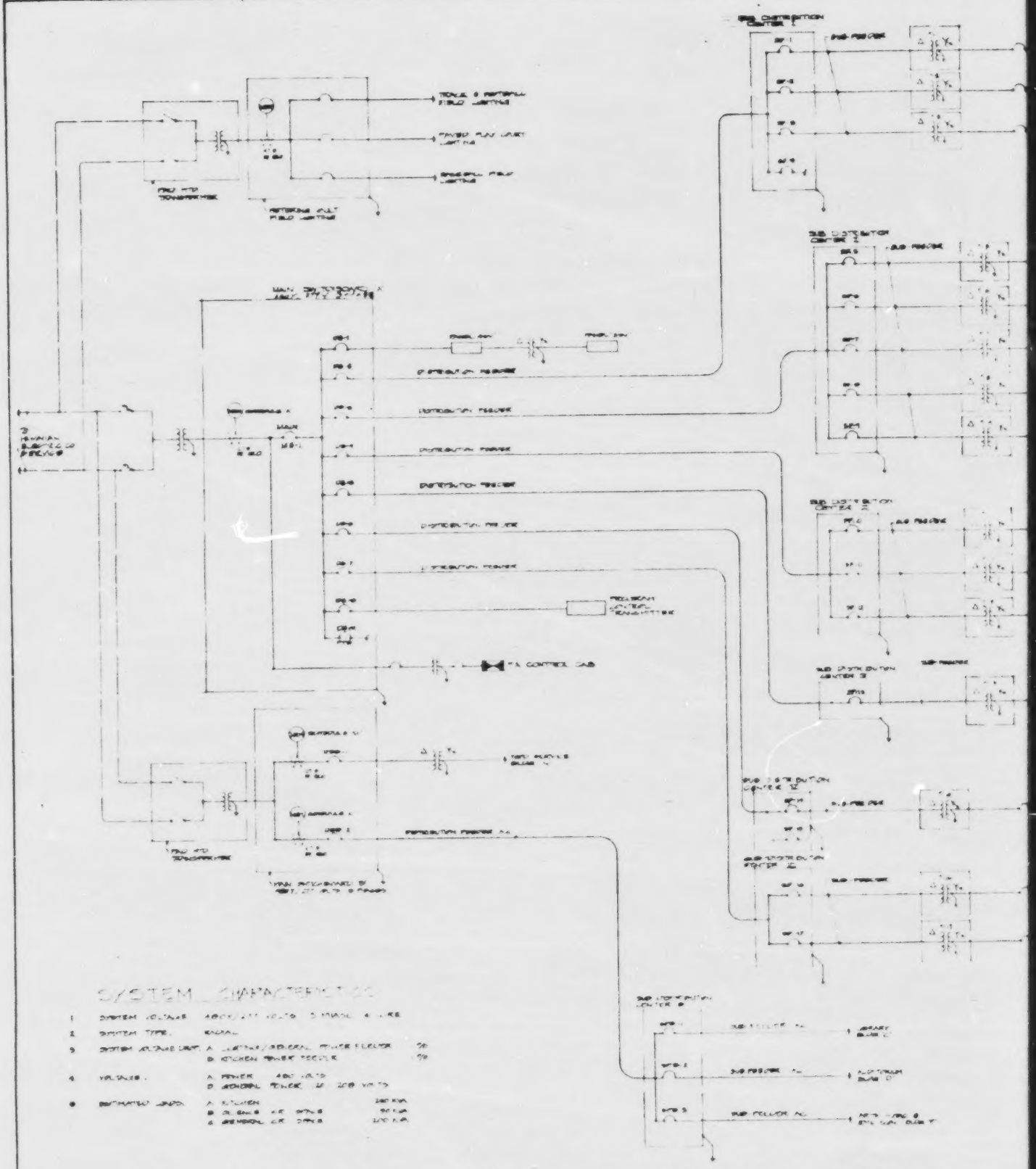
MOANALUA, OAHU, HAWAII

ULTIMATE POWER & COMMUNICATIONS (RACEWAY)

ULTIMATE POWER & COMMUNICATIONS PLAN (RACEWAY)

ARBE, ARUSA ARB ASSOCIATES, INC ARCHITECTS

IX

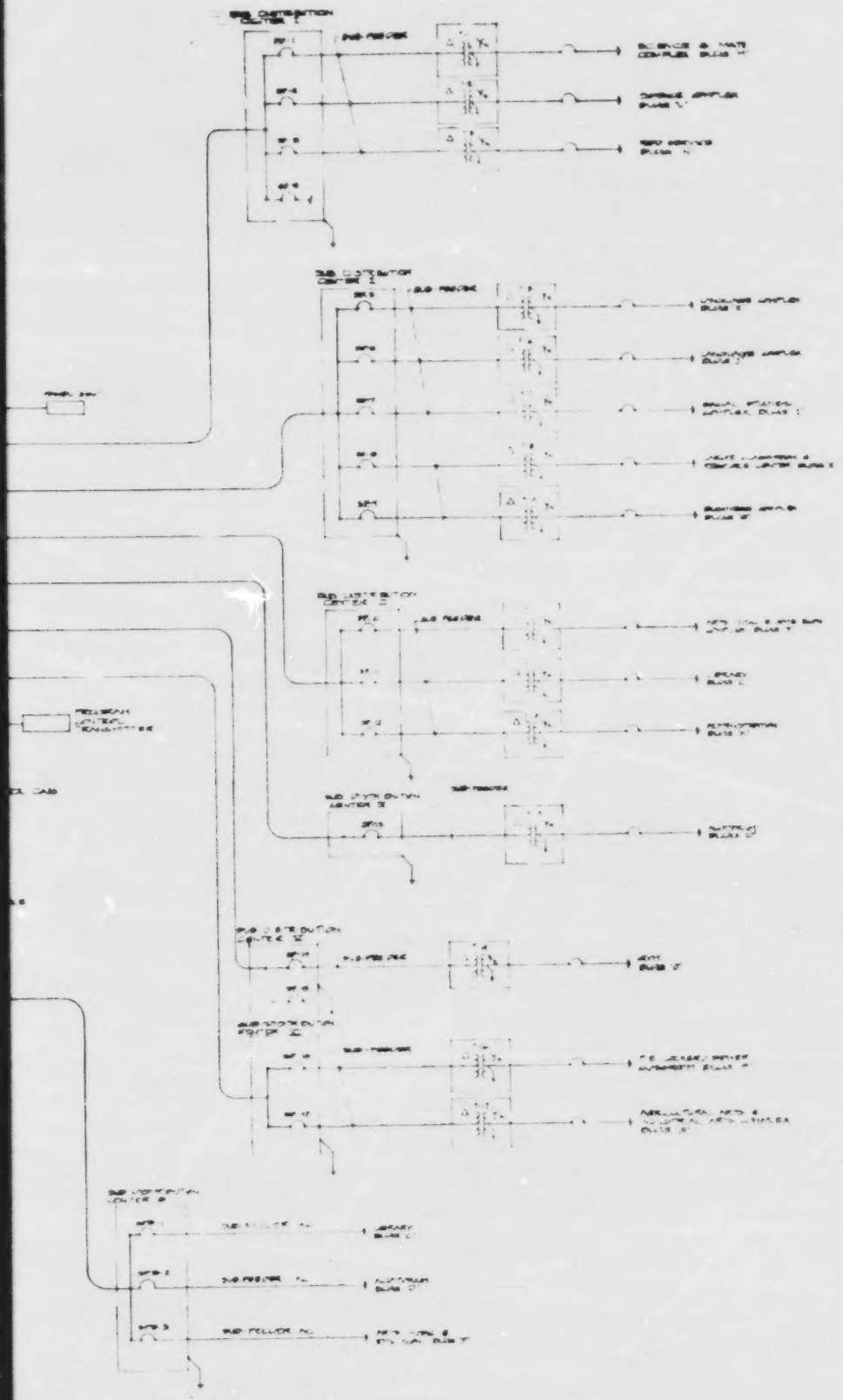


ULTIMATE ONE-LINE DIAGRAM

MOANALUA HIGH SCHOOL

MOANALUA, OAHU, HAWAII

ULTIMATE POWER & COMMUNICA
(CIRCUITING)



ULTIMATE ONE-LINE DIAGRAM

ULTIMATE POWER & COMMUNICATIONS PLAN
(CIRCUITING)

ALUA, OAHU, HAWAII

ABBE, ARUGA AND ASSOCIATES, INC. ARCHITECTS

X

9.1 One-Line Diagram

One-line diagrams for each classroom building are shown in Figures XII to XVIII. These diagrams show the preferred arrangement of classroom and/or other units within each building; forming the basis for the sizes and shapes of the buildings as shown in the Ultimate Site Plan, Figure XI.

The criteria considered in arriving at the above arrangements are:

A. Grouping classrooms according to learning centers for operational efficiency.

B. Arranging classrooms within and between the learning centers to obtain the best functional relationship of facilities.

C. Stacking classrooms requiring plumbing fixtures to minimize cost.

D. Placing teacher workrooms and student resource centers in strategic locations for purposes of control and convenience.

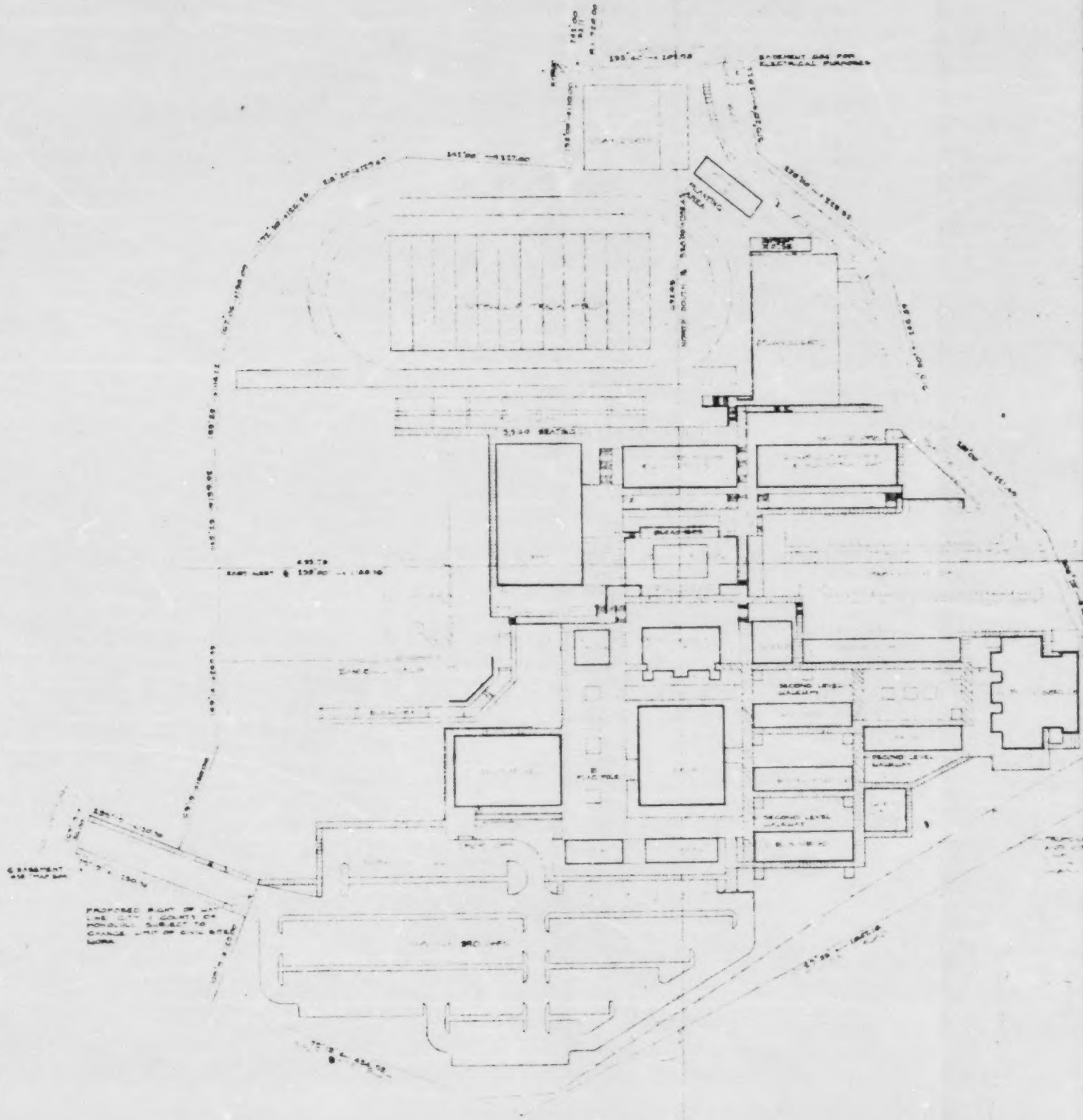
E. Isolating noise generating classrooms to minimum disturbances.

F. Grouping and placing of special type classrooms to provide construction in early increments.

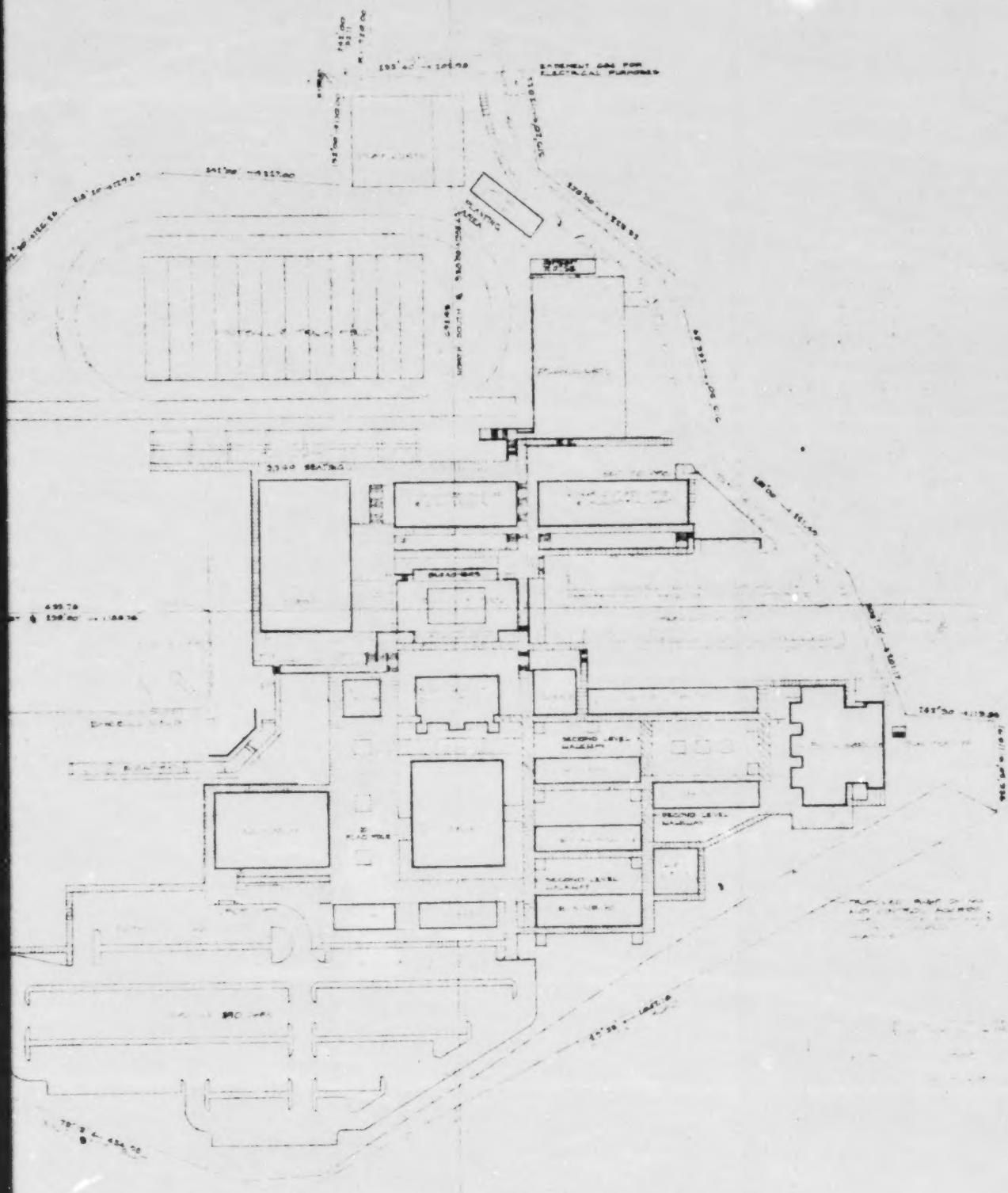
9.2 Space Requirements

The space requirements for the buildings in the Ultimate Site Plan are summarized in Figures XIX and XX. These summaries are based on the one-line diagrams.

The tabulated areas referred to in the space requirement summaries include the wall areas. Toilets, stairways and lanais are also computed in the total building area. Space requirements have been followed closely but adjustments were necessary to group proper functions in each building.



ULTIMATE SITE PLAN



ULTIMATE SITE PLAN **XI**

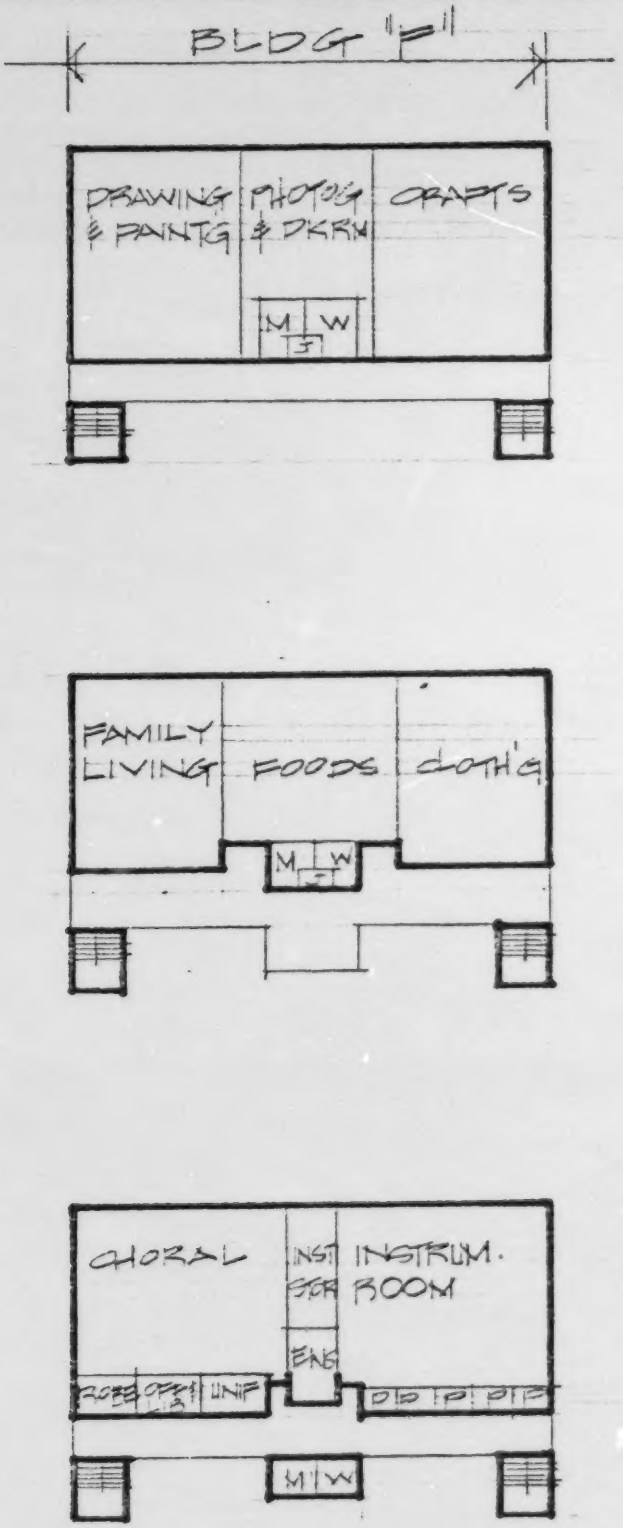
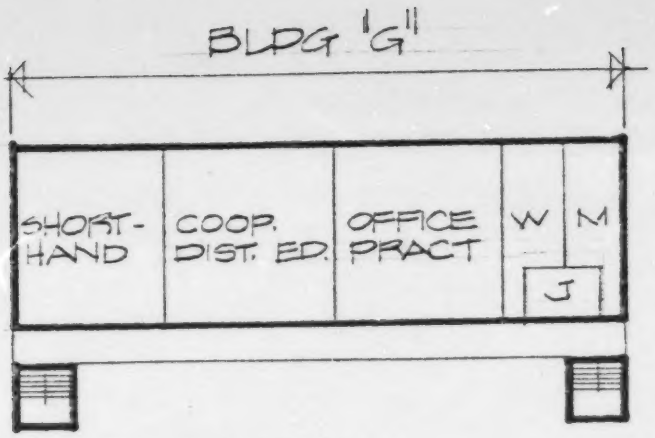
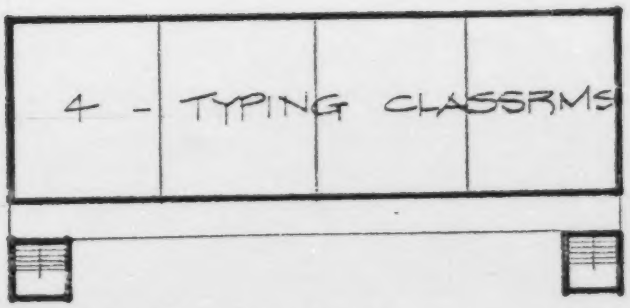


Fig. XII

BUILDING "F"
MUSIC, HOME EC. & ART





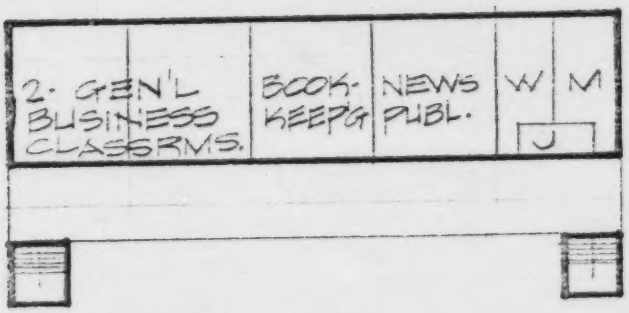


Fig. XIII

Page 37

BLDG "G"
BUSINESS & COUNSELING

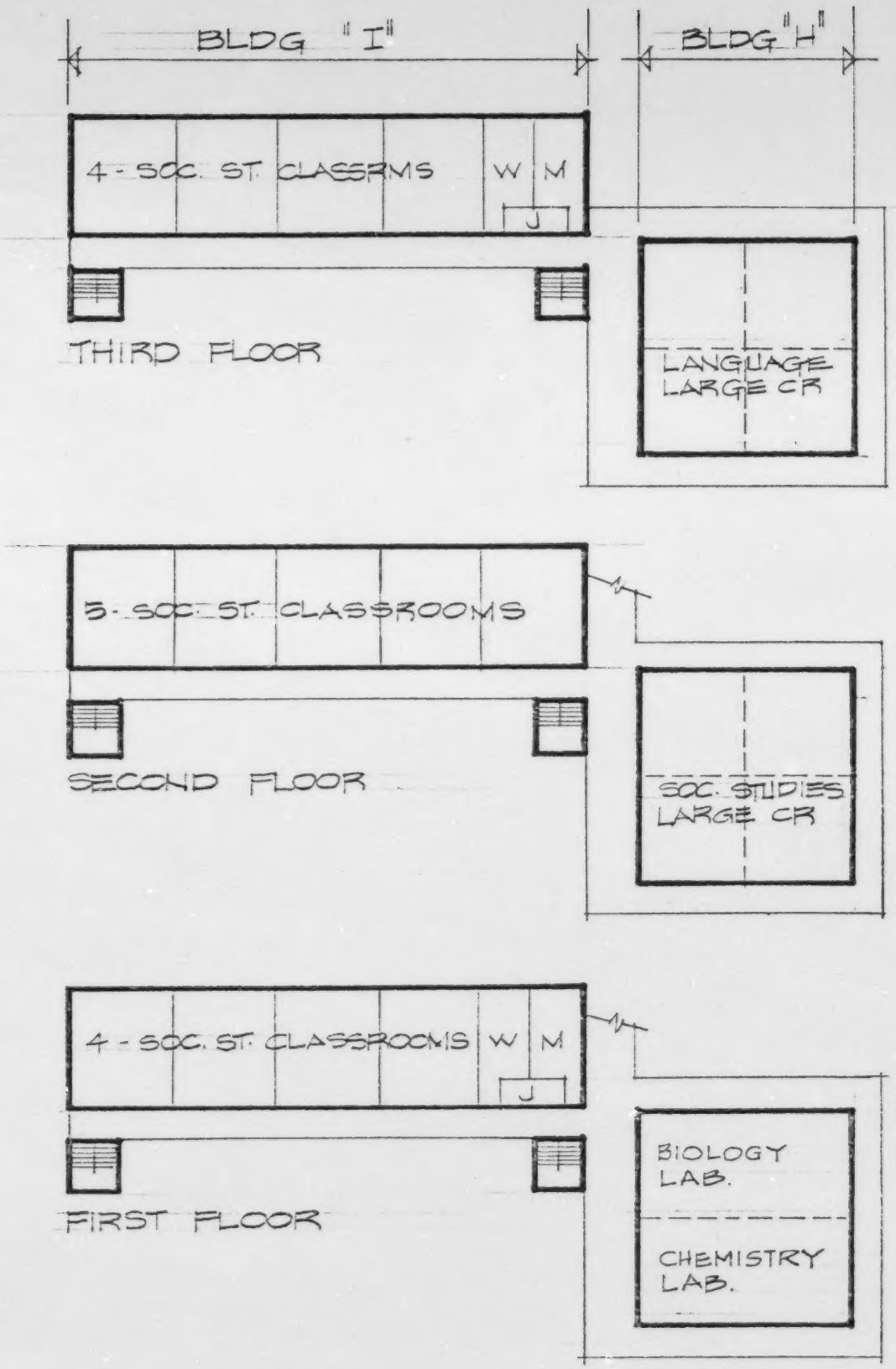


Fig. XIV
Page 38

BLDG "H" & "I"
LANGUAGE & SOCIAL STUDIES & SCIENCE

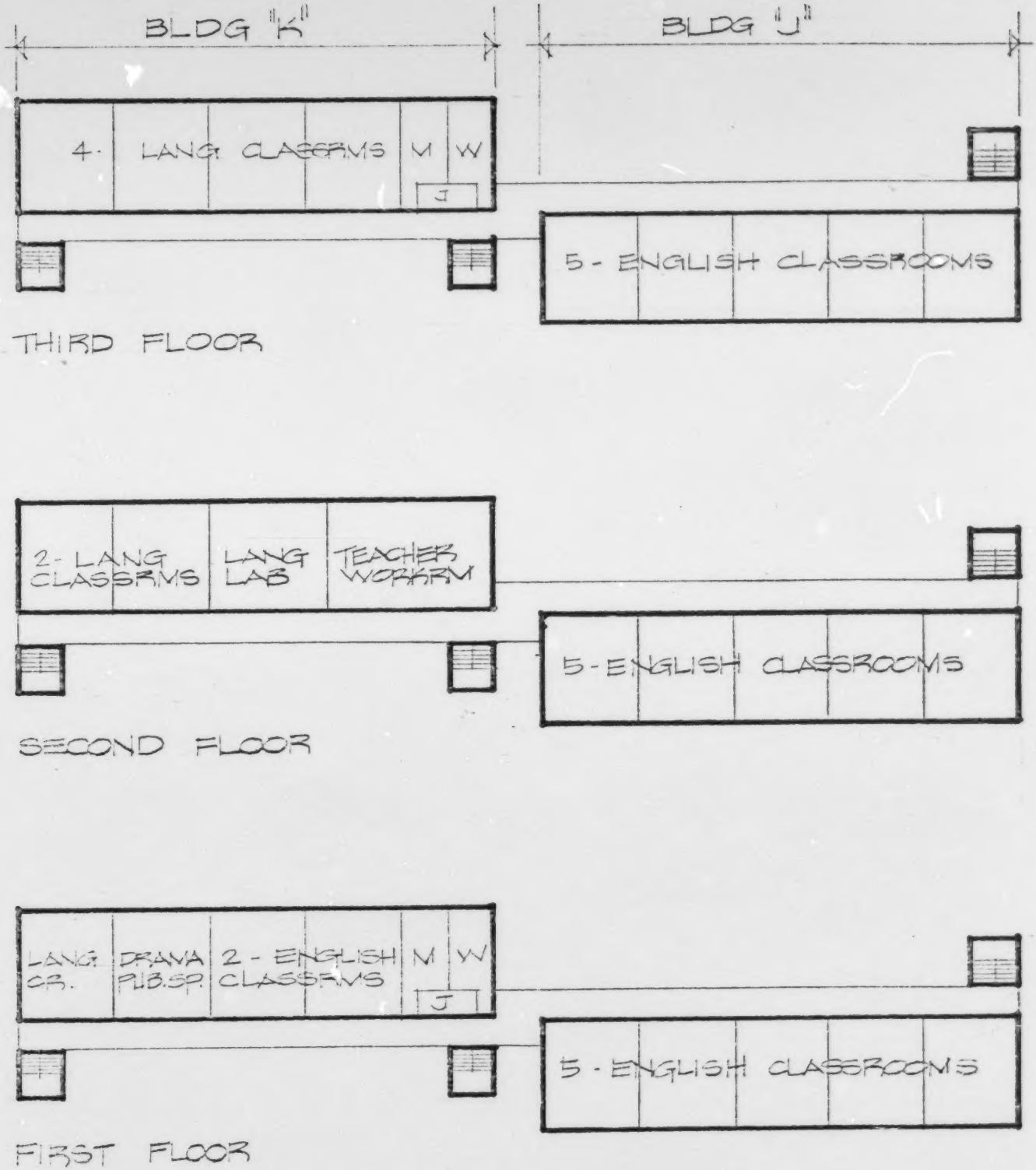
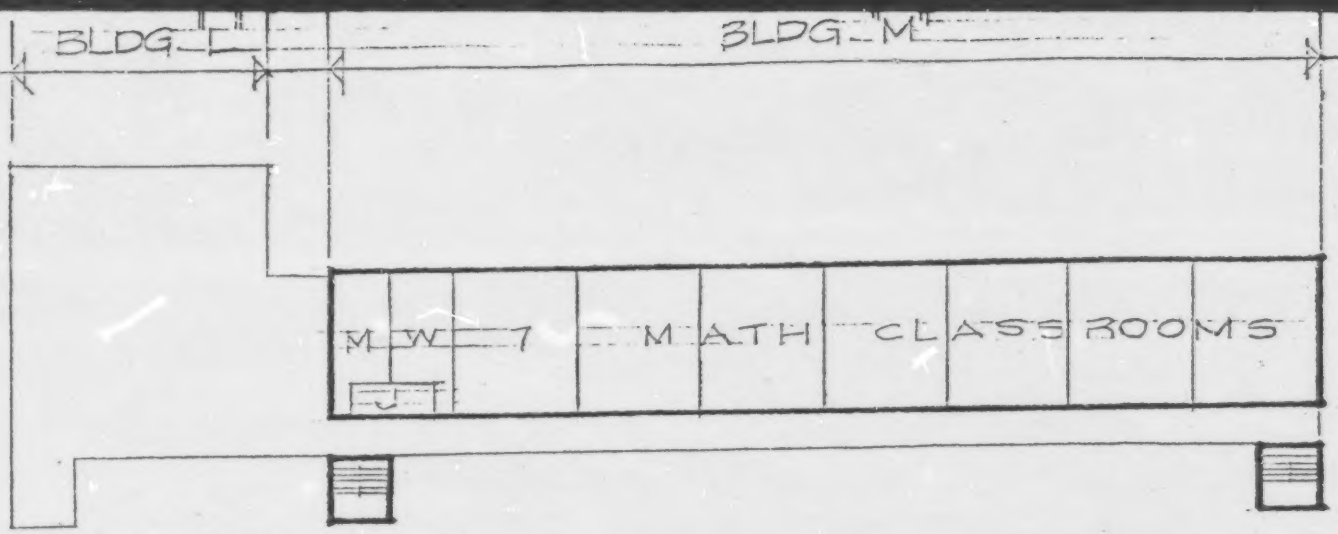


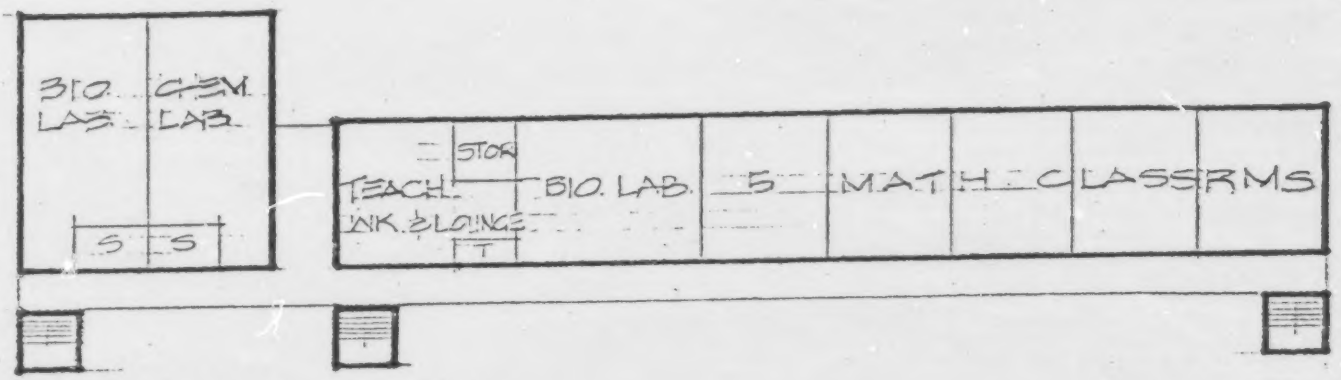
Fig. XV

Page 33

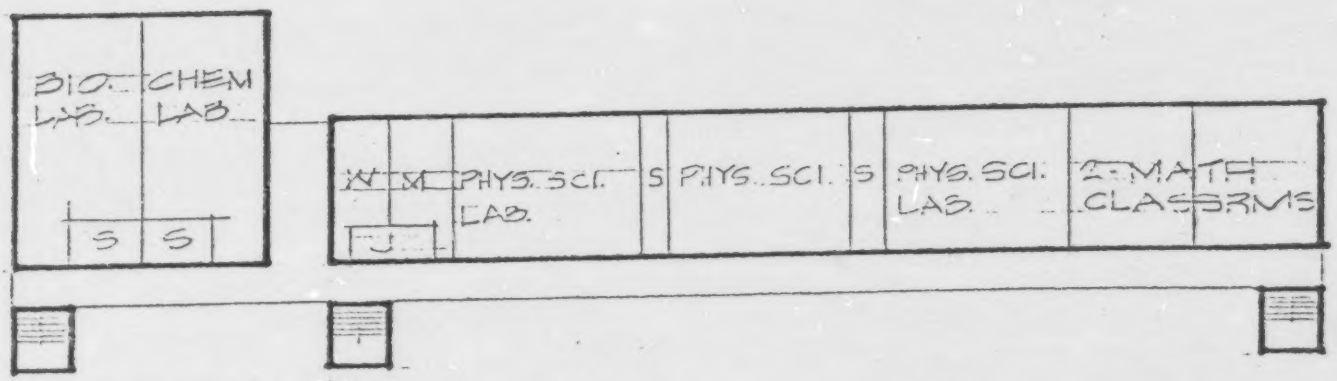
BLDG "J" & "K"
LANGUAGE



THIRD FLOOR



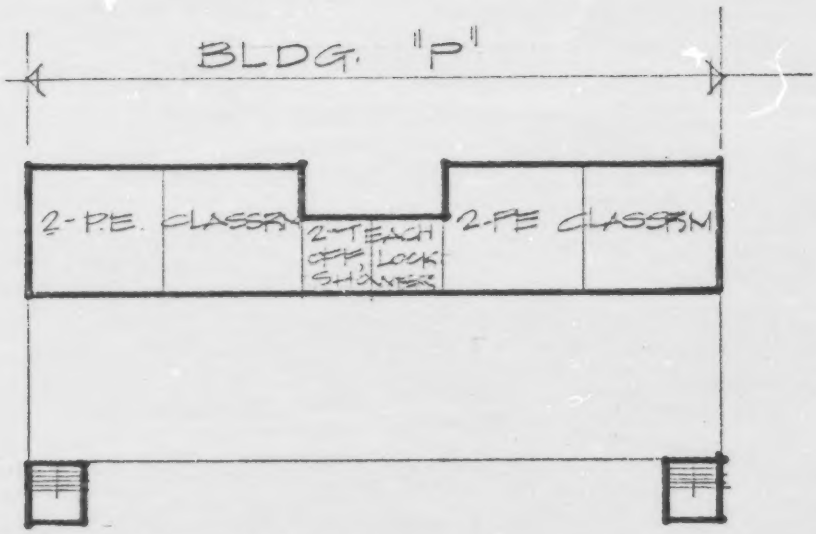
SECOND FLOOR



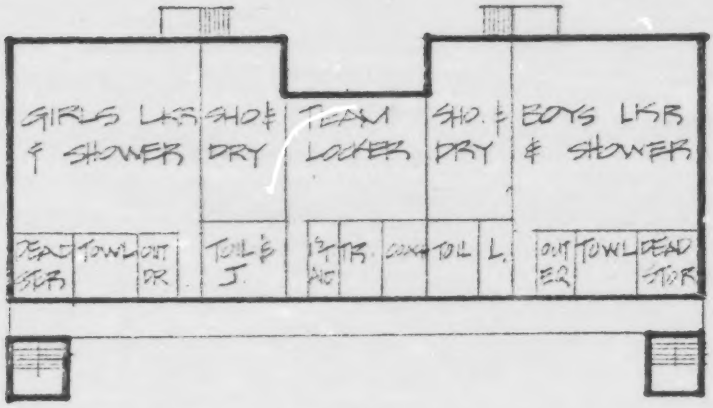
FIRST FLOOR

Fig. XVI

BLDG "L" & "M"
MATH & SCIENCE



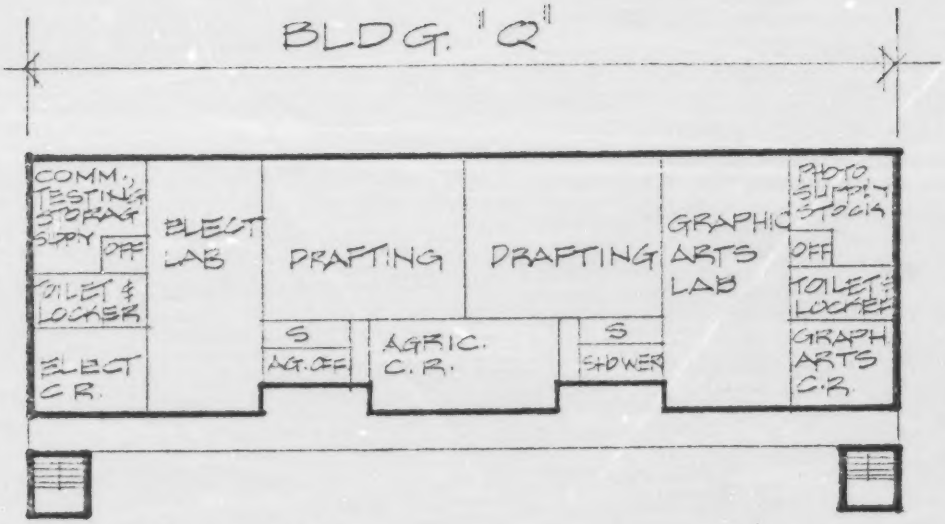
UPPER LEVEL



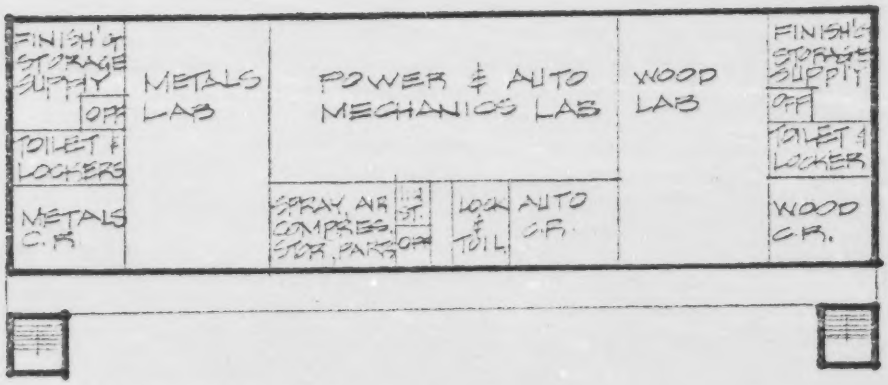
LOWER LEVEL

Fig. XVII

BUILDING "P"
PHYSICAL EDUCATION



UPPER LEVEL



LOWER LEVEL

Fig. XVIII

BUILDING "Q"
INDUSTRIAL & AGRICULTURE ARTS

SUMMARY OF SPACE REQUIREMENTS
INSTRUCTIONAL CENTERS (By Buildings)

	Unit Capacity	Unit Area (s.f.)	No. of Units	Item Total (s.f.)	Sub Total (s.f.)	Bldg. Total (s.f.)
CR BUILDING "E"						2,500
Lecture-Demonstration					2,500	
Hall, Projection Rm., Platform, Storage & Toilet	150	2,500	1	2,500		
Lanais not included						
CR BUILDING "F"	(8-CR)					20,012
Music (1st Floor)					5,820	
Choral Room	100	2,000	1	2,000		
Instrumental Room	100	2,400	1	2,400		
Practice Room	5	35	5	175		
Ensemble Room	12	200	1	200		
Instrument Storage		375	1	375		
Uniform Storage		150	1	150		
Robe Storage		150	1	150		
Office and Library		150	1	150		
Toilets		110	2	220		
Home Economics (2nd Floor)					4,920	
Family Living	32	1,600	1	1,600		
Foods	32	1,500	1	1,500		
Clothing	32	1,600	1	1,600		
Toilets		90	2	180		
Janitor Closet		40	1	40		

Figure XIX-a

	Unit Capacity	Unit Area (s.f.)	No. of Units	Item Total (s.f.)	Sub Total (s.f.)	Bldg. Total (s.f.)
Art (3rd Floor)					4,910	
Drawing & Painting	32	1,700	1	1,700		
Crafts	32	1,920	1	1,920		
Photography & Darkroom	32	960	1	960		
Toilet		144	2	288		
Janitor Closet		42	1	42		
Lanais & Stairs				4,362	4,362	
CR BUILDING "G"	(11-CR)					22,510
Business Education (1st, 2nd, 3rd Floors)					16,910	
Typing Classroom	36	1,530	4	6,120		
Shorthand Classroom	32	1,500	1	1,500		
Gen. Business Classroom	32	960	2	1,920		
Off. Practice Classroom	32	1,644	1	1,644		
Coop. Dist. Education	32	1,650	1	1,650		
Bookkeeping Classroom	32	960	1	960		
News Publication	32	960	1	960		
Toilets		500	2	1,000		
Janitor Closets		204	1	204		
Toilet		412	2	824		
Janitor Closets		128	1	128		
Lanais & Stairs					5,600	
CR BUILDING "H"	(8-CR)					18,978
Large Classrooms (2nd & 3rd Floors)					10,880	
Language Large CR	120	3,840	1	3,840		
Social Studies CR	120	3,840	1	3,840		
Biology Lab	32	1,440	1	1,440		
Chemistry Lab	32	1,440	1	1,440		
Storage		160	2	320		
Lanais					8,098	

Figure XIX-b

	Unit Capacity	Unit Area (s.f.)	No. of Units	Item Total (s.f.)	Sub Total (s.f.)	Bldg. Total (s.f.)
CR BUILDING "I"	(13-CR)					18,724
Social Studies					14,384	
Soc. Studies Classrooms	30	960	13	12,480		
Toilets		412	4	1,648		
Janitor Closet		128	2	256		
Lanais & Stairs					4,340	
CR BUILDING "J"	(15-CR)					19,020
Language (1st, 2nd, 3rd Floors)					14,400	
English Classrooms	30	960	15	14,400		
Lanais & Stairs					4,620	
CR BUILDING "K"	(11-CR)					18,644
Language (1st, 2nd, 3rd Floors)					14,304	
Language Classrooms	30	960	7	6,720		
English Classrooms	30	960	2	1,920		
Language Lab.		1,100	1	1,100		
Drama & Pub. Speaking		960	1	960		
Teacher Wkrm., lounge		1,700	1	1,700		
Toilets		412	4	1,648		
Janitor Closet		128	2	256		
Lanais & Stairs					4,340	
CR BUILDING "L"	(6-CR)					8,790
Science (1st, 2nd, 3rd Floors)					6,400	
Biology Lab	32	1,440	2	2,880		
Chemistry Lab	32	1,440	2	2,880		
Storage		160	4	640		
Lanais & Stairs					2,390	

Figure XIX-c

	Unit Capacity	Unit Area (s.f.)	No. of Units	Item Total (s.f.)	Sub Total (s.f.)	Bldg. Total (s.f.)
CR BUILDING "M"	(18-CR)					29,395
Science (1st, 2nd Floors)					7,611	
Physical Science Lab	32	1,440	3	4,320		
Biology Lab	32	1,440	1	1,440		
Storage (Biology)		160	1	160		
Storage (Phy. Science)		240	2	480		
Teacher Wkrm., Lounge, Toilet		1,211	1	1,211		
Mathematics (1st, 2nd, 3rd Floors)					15,344	
Mathematics Classroom	30	960	14	13,440		
Toilets		412	4	1,648		
Janitor Closet		128	2	256		
Lanais & Stairs					6,440	
BUILDING "O"						34,200
Gymnasium					34,200	
Lobby (Ticket Booth, Office, Snack, Toilet, Janitor)		3,000	1	3,000		
Main Floor	3,000	18,000	1	18,000		
Aux. Phy. Ed. (Mezz.)		1,800	2	3,600		
Team Facilities	15	1,000	2	2,000		
Storage		300	2	600		
Concession, Toilets &		7,000*	1	7,000		

* Spectator facilities for football games. Areas given are approximate.

Figure XIX-d

	Unit Capacity	Unit Area (s.f.)	No. of Units	Item Total (s.f.)	Sub Total (s.f.)	Bldg. Total (s.f.)
CR BUILDING "P"	(4-CR)					21,492
Physical Ed. Facilities					13,632	
Phy. Ed. Classroom	40	960	4	3,840		
Teacher - Off., Shower/ Locker	2	288	2	576		
Dressing - Locker	500	2,062	2	4,124		
Shower - Drying	30	850	2	1,700		
Team Locker		1,063	1	1,063		
Coach's Office		175	1	175		
Training		175	1	175		
First Aid		123	1	123		
Laundry		140	1	140		
Dead Storage		225	2	450		
Towels		225	2	450		
Outdoor Equipment		128	2	256		
Toilet & Janitor		350	1	350		
Toilet		210	1	210		
Lanais & Stairs					7,860	
CR BUILDING "Q"	(8-CR)					27,416
Metals Shop (1st Floor)					3,520	
Metals Lab.	30	1,960	1	1,960		
Metals Classroom	30	520	1	520		
Finishing, Stor., Supply		640	1	640		
Office	1	80	1	80		
Toilet & Locker		320	1	320		

	Unit Capacity	Unit Area (s.f.)	No. of Units	Item Total (s.f.)	Sub Total (s.f.)	Bldg. Total (s.f.)
CR BUILDING "Q" continued						
Wood Shop (1st Floor)					3,680	
Wood Lab	30	2,100	1	2,100		
Wood Classroom	30	520	1	520		
Finishing, Stor., Supply		690	1	690		
Office	1	80	1	80		
Toilet & Locker		290	1	290		
Power & Auto Mechanic Shop (1st Floor)					4,800	
Auto Classroom	30	520	1	520		
Power & Auto Lab	30	3,120	1	3,120		
Office	1	80	1	80		
Liquid Storage		80	1	80		
Spray, Air Comp. Stor. & Parts		680	1	680		
Toilet & Lockers		320	1	320		
Drafting (2nd Floor)					3,640	
Drafting Room	30	1,720	2	3,440		
Storage		100	2	200		
Graphic Arts (2nd Floor)					3,200	
Graph. Arts Classrm.	30	520	1	520		
Graph. Arts Lab	30	1,830	1	1,830		
Office	1	80	1	80		
Photo Lab, Supply & Stock		450	1	450		
Toilet & Lockers		320	1	320		
Electronics (2nd Floor)					3,200	
Electronics Lab	30	1,370	1	1,370		
Electronics Classrm.	30	520	1	520		
Comm., Testing, Stor., Supply		910	1	910		
Office		80	1	80		
Toilet & Lockers		320	1	320		

	Unit Capacity	Unit Area (s.f.)	No. of Units	Item Total (s.f.)	Sub Total (s.f.)	Bldg. Total (s.f.)
CR BUILDING "Q" continued						
Agricultural Technology					1,320	
Agricultural Classroom	30	960	1	960		
Office	1	180	1	180		
Shower & Lockers		180	1	180		
Lanais & Stairs					4,056	
OUTDOOR FACILITIES						366,766
Paved Court		119'x104'	3	37,128	37,128	
25 yds. Swimming Pool		75'-1"x45'	1	3,378	3,378	
Pool Equip. & Storage		500	1	500	500	
Baseball Field		300'x300'	1	90,000	90,000	
Football & Track Field		270'x580'	1	156,000	156,000	
Playfields		250'x300'	1	75,000	75,000	
Apparatus Area		40'x119'	1	4,760	4,760	

SUMMARY OF SPACE REQUIREMENTS
SUPPORTING CENTERS (BY BUILDINGS)

	Unit Capacity	Unit Area (s.f.)	No. of Units	Item Total (s.f.)	Sub Total (s.f.)	Bldg. Total (s.f.)
BUILDING "A" (Administration)						2,735
Administrators					890	
Principal	1	200	1	200		
Vice Principal	1	120	2	240		
Conference	15	450	1	450		
Communication					80	
PA Room	3	80	1	80		
Business Office					1,765	
Lobby	6	250	1	250		
General Office		600	1	600		
Workroom	3	400	1	400		
Bookkeeper	1	100	1	100		
Restroom		100	2	200		
Hall		215		215		
Lanais not included						
BUILDING "B" (Counseling)						3,380
Student Service & Guidance					2,780	
Student Gov't.		980	1	980		
Conference	9	200	1	200		
Student Act. Dir.	2	120	1	120		
Itinerant Specialist	3	120	1	120		
Counseling Offices	3	120	8	960		
JPO		80	1	80		
Lobby & Hall		320		320		

Figure XX-a

	Unit Capacity	Unit Area (s.f.)	No. of Units	Item Total (s.f.)	Sub Total (s.f.)	Bldg. Total (s.f.)
BUILDING "B" continued						
Health Services					600	
Health Room	4	400	1	400		
Toilet		50	1	50		
Examination Room		150	1	150		
Lanais not included						
BUILDING "C" (Library)						16,200
Library Areas					14,840	
Reading Room	300	10,500	1	10,500		
Listening/Viewing	30	200	1	200		
Conference		500	1	500		
Stack		960	1	960		
Storage		480	1	480		
Librarian's Office		400	1	400		
Professional Staff & Material		300	1	300		
Departmental Resource Centers		500	3	1,500		
Audio-Visual					1,360	
AV Office		150	1	150		
AV Control Rm.		150	1	150		
AV Storage		200	1	200		
Av Production		400	1	400		
Toilet		200	2	400		
Janitor Closet		60	1	60		
Lanais not included.						

Figure XX-b

	Unit Capacity	Unit Area (s.f.)	No. of Units	Item Total (s.f.)	Sub Total (s.f.)	Bldg. Total (s.f.)
BUILDING "D" (Auditorium)						15,660
Auditorium					15,660	
General Seating	1,000	8,000	1	8,000		
Stage		3,000	1	3,000		
Property & Scene Shop		1,200	1	1,200		
Dressing & Toilets		650	2	1,300		
Ticket Off./Booth		200	1	200		
Lobby		1,000	1	1,000		
Projection Booth		500	1	500		
Janitor Closet		60	1	60		
Toilets		200	2	400		
Lanais not included.						
BUILDING "N" (Food Service Center)						19,160
Kitchen					5,360	
Food Preparation		1,800	1	1,800		
Serving		1,440	1	1,440		
Compactor/Disposable		200	1	200		
Heater		90	1	90		
Toilet & Lockers		100	2	200		
Office		120	1	120		
Storage		700	1	700		
Chill Room		200	1	200		
Freezer		170	1	170		
Can Wash		100	1	100		
Utility Area and Broom - Linen Closet		340	1	340		

	Unit Capacity	Unit Area (s.f.)	No. of Units	Item Total (s.f.)	Sub Total (s.f.)	Bldg. Total (s.f.)
BUILDING "N" continued						
Dining & Multi-Purpose					11,300	
Dining	1,000	10,000	1	10,000		
Teachers Dining		400	1	400		
Stage		500	1	500		
Boys' & Girls' Dressing		105	2	210		
Boys' & Girls' Toilet		25	2	50		
Amplifier System		10	1	10		
Custodian		50	1	50		
Hallway		80	1	80		
* Lanais					2,500	

* Note lanais calculated at 25% of Dining Space

SECTION IV - SCHEDULING

CHAPTER 10 - INTRODUCTION

10.1 Increments

The implementation of the complex development plan for the Moanalua High School has been divided into ten increments of construction. The last three increments are scheduled under Long Range. The entire first increment is scheduled for completion by 1973-74 school year; the seventh increment by 1979-80 school year. The Incremental Development Schedule shown on Figure XXI designates the major facilities provided in each increment. The scheduling is based on the growth of the student body. It also reflects implementation considerations regarding facilities, priorities, funding, design and construction timetables, and construction sequences and disturbances. A detailed discussion of each increment is covered under the remaining Chapters of this report.

The incremental plans incorporated in this report are based on the latest enrollment projections that were available at the time the incremental schedule was approved. Subsequently, however, the Department of Education has indicated that there have been some changes in the enrollment projections and the program for the school. Therefore, it is recommended that the classroom and program requirements be re-evaluated and the appropriate changes made to the scope before each increment is initiated.

One change in the facilities required for the school has been the addition of three special education classrooms.

10.2 Program

The phase-in program requires the immediate development of the school to handle students in grade 10 for school year 1972-73; grades 10-11 for school year 1973-74; grades 9-12 for school year 1974-75.

10.3 Cost Factors

The Department of Accounting and General Services provided the unit costs used hereinafter to compute the estimated construction cost. These unit costs are based on January 1, 1971 prices. To determine the Construction Cost in the future, these prices were escalated at 6% per year from January 1, 1971 up to the time of bid opening. The escalated construction cost plus inspection, contingencies, design and works of art represents the total construction funds required.

Planning cost for each increment is based on the escalated construction cost plus works of art. The scope involves design and administering of the project until notice to proceed with construction is given.

Two percent of the appropriated funds for the project is allocated to landscaping and a special fund to purchase works of art. The planning and construction funds represents the total funds required for the increment.

10.4 Time Factors

There are three general time factors involved from the time planning funds are released by the Governor to the completion of the project, namely, design, contract and construction. Each factor must be completed before the next can begin.

Design time covers fee negotiations, design, preparation of plans, reviews by various government agencies and the preparation of contract documents. Pre-schematics, schematics, pre-final and final plans are considered Preparation of Construction Plans.

The second factor, contract time, includes advertising, opening of bids, award of contract and notice to proceed.

The third factor, construction time, includes time from notice to proceed to final inspection of the project.

The period allocated for each of the above time factor is based on the estimated construction cost for the project.

10.5 Latest Start Time

The Time Schedule for each increment is based on the time factors mentioned previously. It indicates the latest time design, contract and construction can be started to complete the project by August 1 of the programmed year. This allows the school about one month of preparation time before school opens in September. The time schedule for each increment also determines when planning and construction funds should be made available.

MOANALUA HIGH SCHOOL
INCREMENTAL DEVELOPMENT SCHEDULE

INCREMENT	SCHOOL YEAR	ENROLLMENT PROJECTIONS	CLASSROOMS REQUIRED	CLASSROOMS PROVIDED	FACILITY (NO. OF CLASSROOMS)
1	1973-74	544	18	22	Bldg. M-Science and Math (18) Bldg. N-Food Service Bldg. P-Health CR (4) Football Field Parking, 163 cars, service road Utilities Bldg.
2	1974-75	1069	34	42	Bldg. Q-Industrial Arts, Ag. (8) Bldg. L-Science Labs (4) Bldg. F-Art, Music, Home Ec. (8) Paved playcourt Bleachers & Track Parking, 62 cars, main access road
3	1975-76	1434	45	53	Bldg. G-Business (11) Bldg. C-Library Bldg. O-Gym Saran House & Green House Parking, 110 cars Baseball Field w/bleachers, Playfield
4	1976-77	1650	52	64	Bldg. K-Language (11) Bldg. E-Lecture Demonstration
5	1977-78	1738	54	65	Bldg. A-Administration Bldg. B-Counseling, Student Gov't (1) Parking, 48 cars
6	1978-79	1800	57	65	Swimming Pool
7	1979-80	1860	59	65	Bldg. D-Auditorium
8	Long Range	2300	73	78	Bldg. I-Social Studies (13) Parking, 132 cars
9	Long Range	2600	79	88	Bldg. H-Language (4) Social Studies (4) Science Labs (2)
10	Long Range	3000	95	103	Bldg. J-Language (15)

Figure XXI
Page 56

CHAPTER 11 - FIRST INCREMENT

11.1 Facilities

Under the first increment, Figure XXII the following facilities will be constructed:

Bldg. "M" - Science & Mathematics, 18-CR
Bldg. "N" - Food Service
Bldg. "P" - PE Locker & Shower and Classrooms, 4-CR
Utility Building
Football Field
Parking (163 cars), Service Road

11.2 Cost

The computations for the first increment funding requirements are shown herein.

Buildings	Area	Unit Cost	Cost
SCIENCE & MATHEMATICS (18-CR)			
Science	6,400	$ 31.00	$ 198,400
Math & Teacher's Area	14,651	24.00	351,624
Lanais & Stairs	6,440	11.00	70,840
Toilets & Janitor	1,904	35.00	66,640
TOTAL	29,395 sf		$ 687,504
FOOD SERVICE			
Cafetorium (Stage, Kitchen, Dining)	16,360	$ 34.00	$ 556,240
Toilets & Janitor	300	35.00	10,500
Lanais	2,500	9.00	22,500
TOTAL	19,160 sf		$ 589,240
P.E. LOCKER-SHOWER & CLASSRMS (4-CR)			
Locker & Shower	8,932	$ 32.00	$ 285,824
P.E. Classrm. & Teacher's Area	4,000	24.00	96,000
Toilets & Janitor, Laundry	700	35.00	24,500
Lanais & Stairs	7,860	11.00	86,460
TOTAL	21,492 sf		$ 492,784

	Area	Unit Cost	Cost
UTILITY BUILDING			
Transformer, Switch & Pump	625 sf	$ 25.00	$ 15,625
TOTAL BUILDINGS COST			$ 1,785,153

FURNITURE AND EQUIPMENT

Building	Description	Estimated Quantity	Unit	Unit Price	Total Cost
BUILDING "M"					$ 20,355
Math & Science (18-CR)	Math	14	each	$ 1,135	$ 15,890
	Science	4	each	960	3,840
	Teacher Workroom	1	each	625	625
BUILDING "N"					$ 11,410
Food Service	Kitchen	1	each	$ 60	$ 60
	Dining	1	each	11,350	11,350
BUILDING "P"					$ 2,920
P.E. Locker & Shower, 4 CR	P.E. Classroom	4	each	$ 685	$ 2,740
	Teacher Office	2	each	90	180
TOTAL FURNITURE & EQUIPMENT					$ 34,685

	Estimated Quantity	Unit	Unit Cost	Total Cost
ELECTRICAL				
Handhole Group	13	ea	$ 1,200.00	$ 15,600
Ductline	13,000	lf	1.50	19,500
Trenching & Backfill	3,900	lf	6.50	25,350
Sub Distribution Center	2	ea	1,500.00	3,000
Electric Switch Room	1	ls	15,000.00	15,000
Haw'n Elec. Transf. Vault	1	ls	5,000.00	5,000
Haw'n Elec. Transf. Pad	1	ls	500.00	500
Area Lighting	24	ea	400.00	9,600
Distribution Feeder	900	lf	10.00	9,000
Area Lighting Feeder	1,600	lf	.70	1,120
	TOTAL ELECTRICAL			$ 103,670
CIVIL				
Site Preparation	69,289	cy	$ 4.15	$ 287,550
Roadway and Parking	8,857	sy	7.24	64,125
Drainage				
12" pipe	560	lf	12.00	6,720
18" pipe	680	lf	16.00	10,880
24" pipe	2,540	lf	20.00	50,800
Grating Inlet (Field)	17	ea	550.00	9,350
Catch Basin	5	ea	750.00	3,750
Area Drain	1	ea	100.00	100
Drainage Manhole	3	ea	1,000.00	3,000
Grating Inlet (area)	4	ea	250.00	1,000
Connect to Exist.		ls	260.00	260
Sewer System				
6" pipe	220	lf	15.00	3,300
8" pipe	1,440	lf	20.00	28,800
Manhole	8	ea	887.50	7,100
Connect to Exist.		ls	1,100.00	1,100

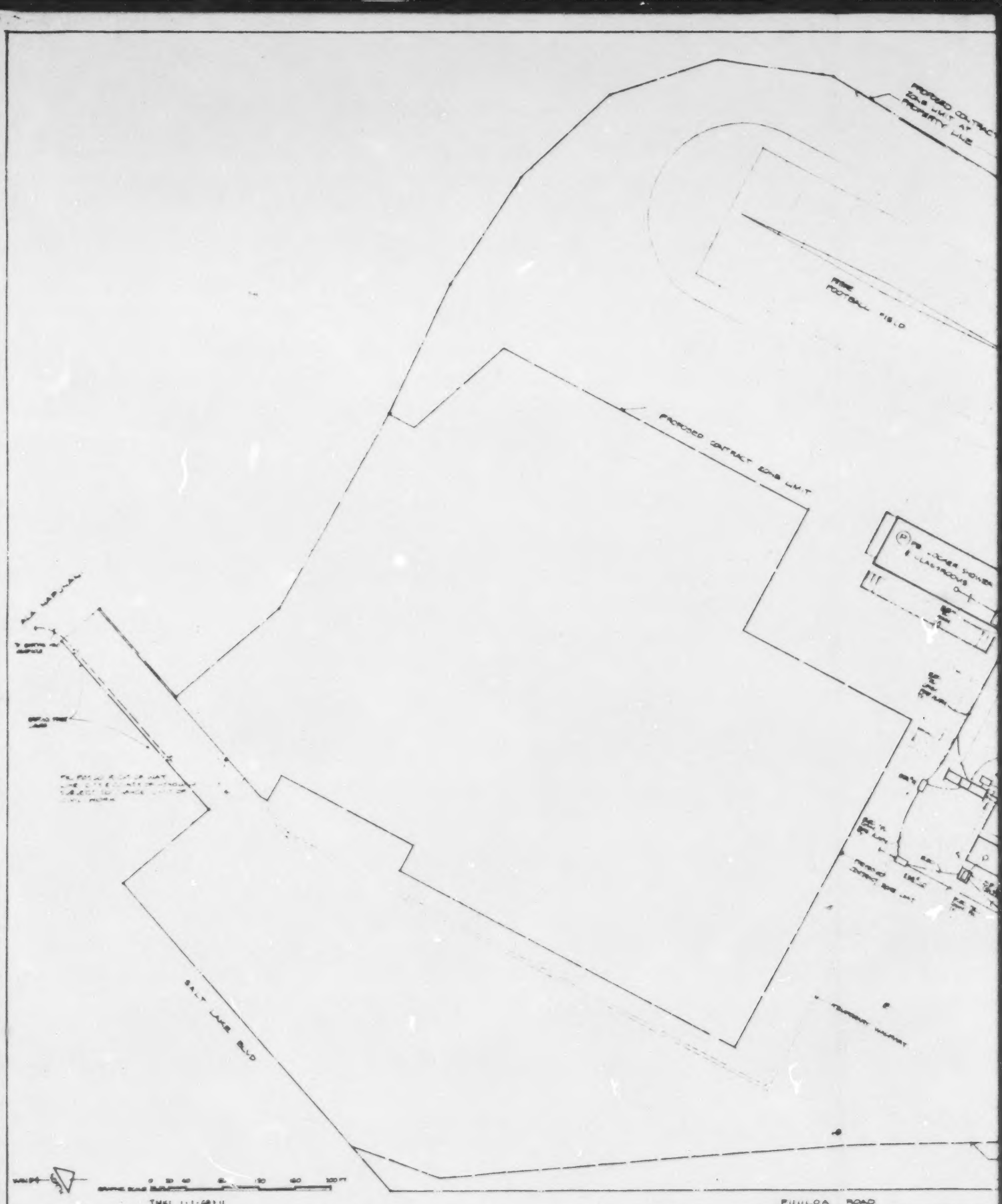
	Estimated Quantity	Unit	Unit Cost	Total Cost
Water System				
1½" copper pipe	25	lf	$ 5.00	$ 125
2" copper pipe	30	lf	6.00	180
2½" copper pipe	20	lf	7.00	140
3" copper pipe	255	lf	8.00	2,040
4" C.I. pipe	2,225	lf	10.00	22,250
6" C.I. pipe	180	lf	13.00	2,340
8" C.I. pipe	1,430	lf	16.00	22,880
Miscellaneous		ls		10,390
Landscaping & Sprinkler	20	ac	12,841.00	256,820
Miscellaneous Structure	3,005	cy	82.20	247,000
	TOTAL CIVIL			$ 1,042,000

	Cost
First Increment Budget	
Science & Mathematics Bldg. (18-CR)	$ 687,504
Food Service Bldg.	589,240
P.E. Locker - Shower & Classroom Bldg. (4-CR)	492,784
Utility Bldg.	15,625
Furniture & Equipment	34,685
Electrical	103,670
Civil	1,042,000
Construction Cost (1/71)	$ 2,965,508
Escalation (20 mos. @ .5%)	296,492
Construction Cost (8/72)	$ 3,262,000
Contingency	30,000
Inspection	35,000
Design	178,000
	$ 3,505,000
Works of Art and Landscaping	70,000
Total Funds Required	$ 3,575,000

11.3 Schedule

The latest start time schedule for this increment is as follows:

November 1970 - Start Design
May 1972 - Start Contract Procedure
August 1972 - Start Construction
August 1973 - Complete Construction



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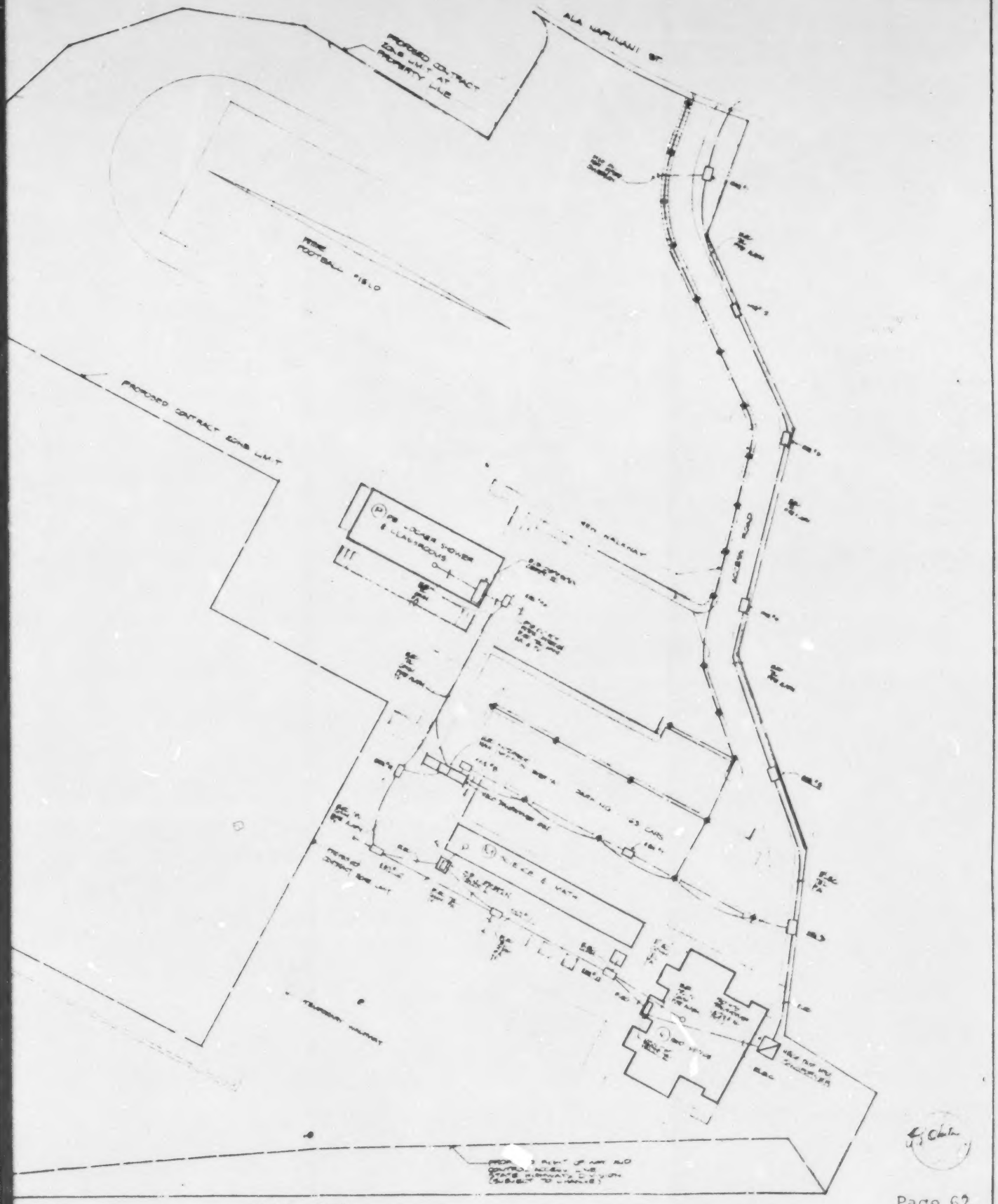

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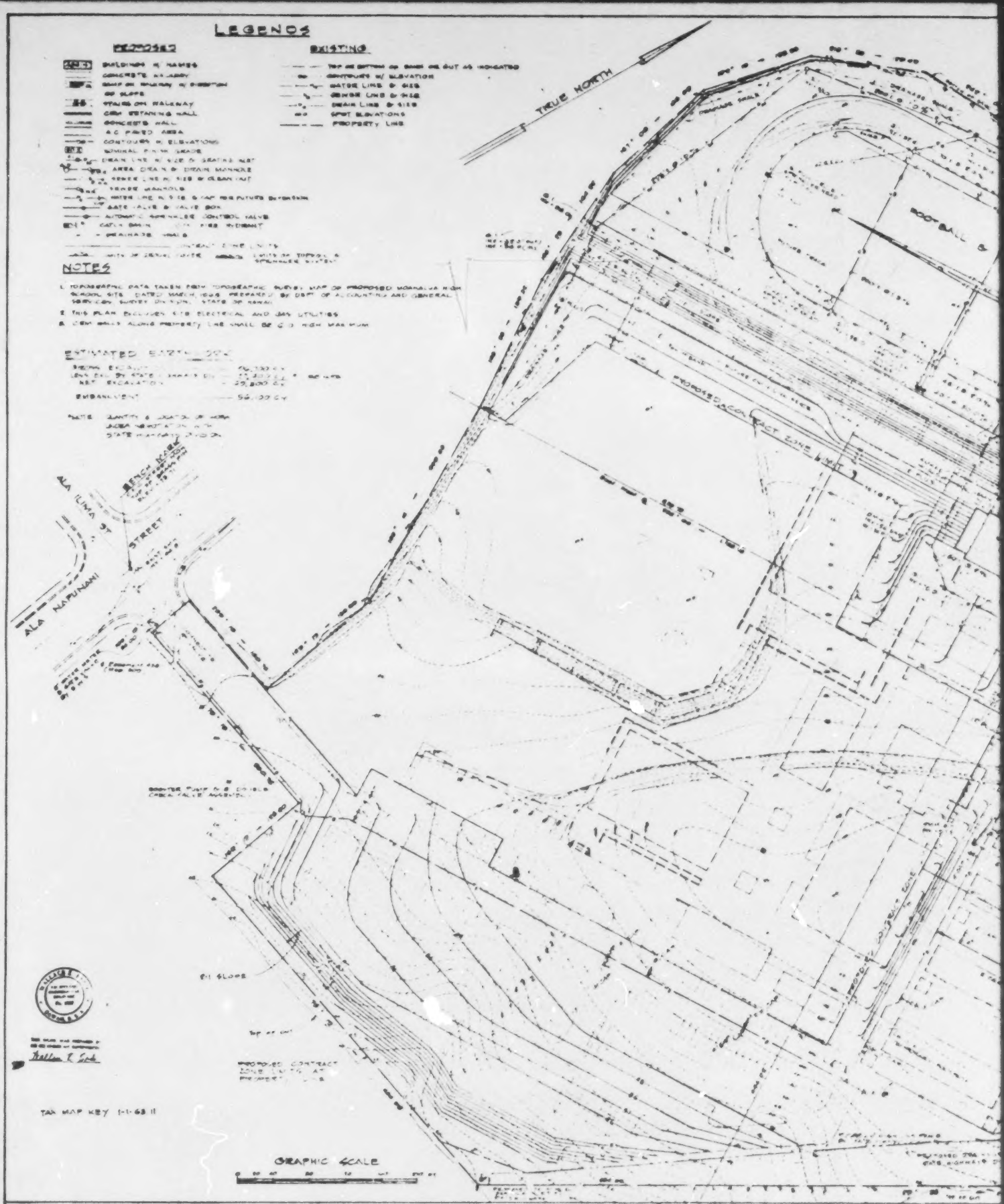
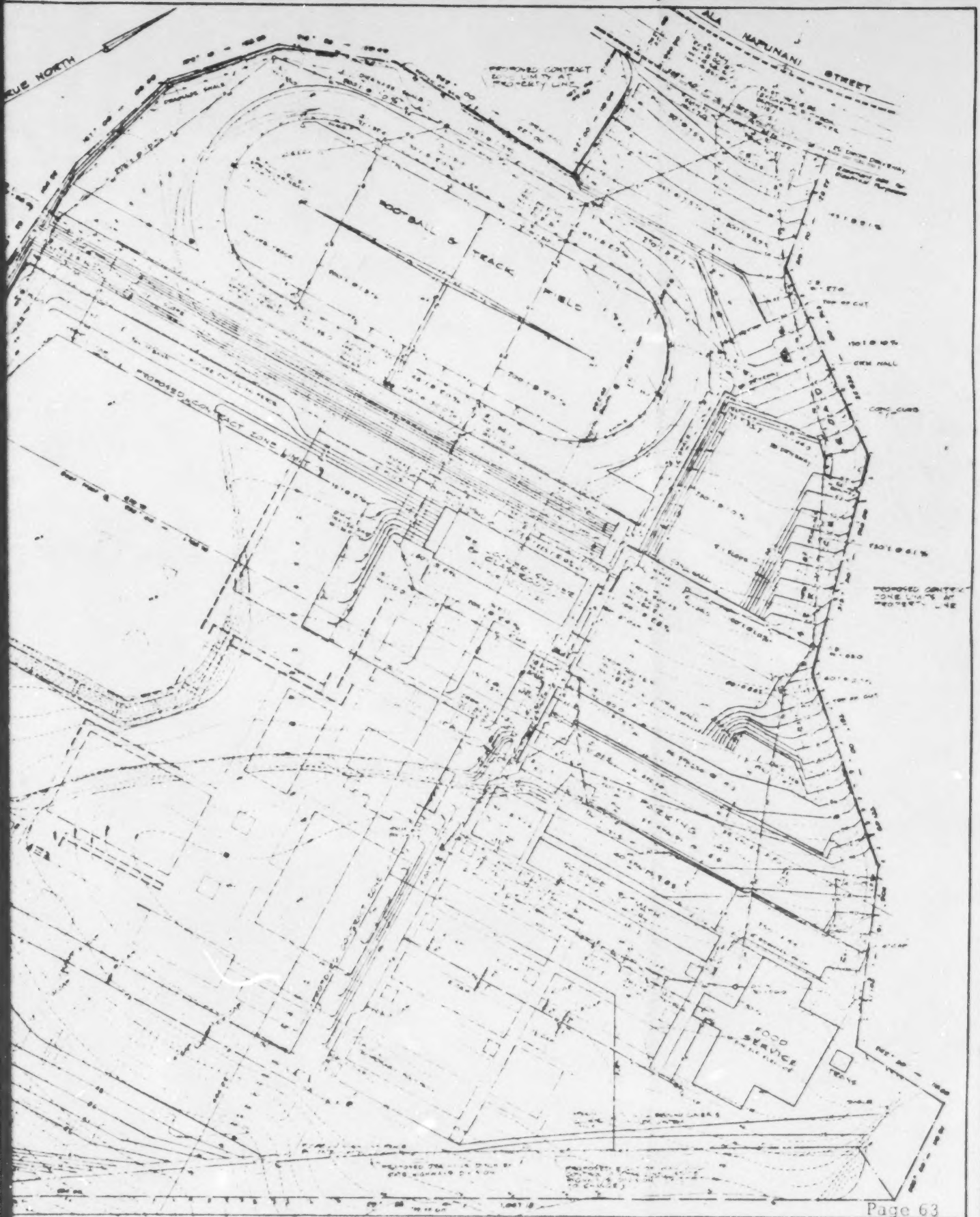


MOANALUA HIGH SCHOOL

MOANALUA, OAHU, HAWAII

FIRST INCREMENT GRADING, DRAINAGE, WA



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CHAPTER 12 - SECOND INCREMENT

12.1 - Facilities

Under the second increment, Figure XXIV, the following facilities will be constructed:

Building "Q" - Industrial Arts, Agriculture, 8-CR
Building "L" - Science Labs., 4-CR
Building "F" - Art, Music, Home Economics, 8-CR
Paved Playcourts
Bleachers & Track
Parking, (62 cars), main access road

12.2 - Cost

The computations for the second increment funding requirements are shown herein.

Buildings	Area	Unit Cost	Cost
INDUSTRIAL ARTS, AGRICULTURE (8-CR)			
Industrial Arts CR	21,610	$ 24.00 *	$ 518,640
Toilets & Lockers	1,570	35.00	54,950
Shower	180	32.00	5,760
Lanais & Stairs	4,056	11.00	44,616
TOTAL	27,416 sf.		$ 623,966
SCIENCE LABS (4-CR)			
Science	6,400	31.00 **	198,400
Lanais & Stairs	2,390	11.00	26,290
TOTAL	8,790 sf.		224,690
FINE ARTS, MUSIC, HOME EC. (8-CR)			
Music	5,600	30.00***	168,000
Home Economics	4,700	25.00*	117,500
Art	4,580	26.00*	119,080
Toilets & Janitor	770	35.00	26,950
Lanais & Stairs	4,362	11.00	47,982
TOTAL	20,012 sf.		479,512
TOTAL BUILDING COST			$1,440,425

Building	Area	Unit Cost	Cost
OUTDOOR FACILITIES			
Paved Playcourts	37,128	$ 3.00	$ 111,384
Bleachers (football) seats	4,830	30.00	144,900

FURNITURE AND EQUIPMENT

Building	Description	Estimated Quantity	Unit	Unit Price	Total Cost
Building "Q"					$ 16,780
Indus. Arts, Ag., (8-CR)	Ag. Classrooms	1	each	520	520
	Electronics CR	1	each	520	520
	Graphic Arts CR	1	each	520	520
	Metals CR	1	each	520	520
	Woods CR	1	each	520	520
	Auto CR	1	each	520	520
	Drafting	2	each	6,830	13,660
BUILDING "L"					$ 3,840
Science Lab (4-CR)	Science	4	each	960	
BUILDING "F"					$ 10,935
Art, Music Home Eco. (8-CR)	Art	1	each	1,920	1,920
	Crafts	1	each	1,280	1,280
	Photography	1	each	1,135	1,135
	Choral	1	each	640	640
	Band	1	each	1,640	1,640
	Family Living	1	each	1,440	1,440
	Foods	1	each	1,440	1,440
	Clothing	1	each	1,440	1,440
	TOTAL FURNITURE & EQUIPMENT				$ 31,555

	Estimated Quantity	Unit	Unit Cost	Total Cost
ELECTRICAL				
Handhole	1	ea	$ 1,200.00	$ 1,200
Ductline	2,800	lf	1.50	4,200
Trenching & Backfilling	2,700	lf	6.50	17,550
Sub Distribution Center	1	ea	1,500.00	1,500
Area Lighting	4	ea	400.00	1,600
Distribution Feeder	3,180	lf	10.00	31,800
Playcourt Lights	9	ea	1,500.00	13,500
Haw'n Elec. Transf. Pad		ls		500
Electric Vault		ls		10,000
Football Field Light	6	ea	15,000.00	90,000
Handhole 2' x 4'	15	ea	225.00	3,375
	TOTAL ELECTRICAL			$ 175,225
CIVIL				
Site Preparation	14,976	cy	4.08	$ 61,100
Roadway & Parking	3,809	sy	7.53	28,680
Drainage System				
6" pipe	203	lf	8.00	1,624
12" pipe	190	lf	12.00	2,280
18" pipe	445	lf	16.00	7,120
24" pipe	595	lf	20.00	11,900
Drainage Inlet	12	ea	550.00	6,600
Catch Basin	2	ea	753.00	1,506
Sewer System				
6" VC pipe	140	lf	15.00	2,100
Cleanout	3	ea	70.00	210
Water System				
$2\frac{1}{2}$" copper pipe	40	lf	7.00	280
3" copper pipe	125	lf	8.00	1,000
$2\frac{1}{2}$" Gate Valve	1	ea	100.00	100
Valve Boxes	3	ea	70.00	210
8" C.I. pipe	495	lf	16.00	7,920
6" C.I. pipe	160	lf	13.00	2,080
Landscaping & Sprinkler	1.08	ac	16,963.00	18,320
Miscellaneous Structures	429	cy	96.65	41,460
	TOTAL CIVIL			$ 194,490

	Cost
Second Increment Budget	
Industrial Arts, Agriculture (8-CR)	$ 623,966
Science Labs (4-CR)	224,690
Fine Arts, Music, Home Ec. (8-CR)	479,512
Paved Playcourts	111,384
Bleachers (football)	144,900
Furniture & Equipment	31,555
Electrical	175,225
Civil	194,490
Construction Cost (1/71)	$ 1,985,722
Escalation (33 mos. @ .5%)	328,278
Construction Cost	$ 2,314,000
Contingency	28,000
Inspection	28,000
Design	145,000
	$ 2,515,000
Works of Art and Landscaping	50,000
Total Funds Required	$ 2,565,000

12.3 Schedule

The latest start time schedule for this increment is as follows:

January 1972 - Start Design
June 1973 - Start Construction Procedure
September 1973 - Start Construction
August 1974 - Complete Construction

* Does not include specialized equipment.
** Includes standard equipment.
*** Includes air conditioning.

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DEVELOPMENT, POWER & COMMUNICATIONS PLAN – SECOND INCREMENT

AMBE, ARUGA AND ASSOCIATES, INC. ARCHITECTS

XXIV

CHAPTER 13- THIRD INCREMENT

13.1 - Facilities

Under the third increment, Figure XXV, the following facilities will be constructed:

Building "G" - Business, 11-CR
Building "C" - Library
Building "O" - Gymnasium
Saran House
Greenhouse
Baseball Field with bleachers
Playfield
Parking, (110 cars)

13.2 - Cost

The computations for the third increment funding requirements are shown herein.

Buildings		Area	Unit Cost	Cost
BUSINESS (11-CR)				
Classrooms		14,754	$24.00	$354,096
Toilets & Janitor		2,156	35.00	75,460
Lanais & Stairs		5,600	11.00	61,600
	TOTAL	22,510		$491,156
LIBRARY				
Interior Spaces		15,740	$28.50*	$448,590
Toilet & Janitor		460	35.00	16,100
	TOTAL	16,200		464,690
GYMNASIUM				
Interior Spaces		27,200	$30.00	$816,000
Concession, Toilets & Storage		7,000**	30.00	210,000
	TOTAL	34,200 sf		$1,026,000
SARAN HOUSE		2,400 sf	$15.00	36,000
GREEN HOUSE		1,600 sf	$15.00	24,000
TOTAL BUILDING COST				$2,041,846
OUTDOOR FACILITES				
Bleachers (baseball) seats		1,260	$30.00	$ 37,800

* Includes Air Conditioning and Carpet.
** Spectator facilities for football games. Area given is approximate.

FURNITURE AND EQUIPMENT

Building	Description	Estimated Quantity	Unit	Unit Price ($)	Total Cost ($)
Building "G"					$25,920
Business (11-CR)	Typing	4	each	$3,120	12,480
	General Business	2	each	1,920	3,840
	Shorthand	1	each	1,920	1,920
	Coop. Dist. Ed.	1	each	1,920	1,920
	Office Practice	1	each	1,920	1,920
	Bookkeeping	1	each	1,920	1,920
	News Publication	1	each	1,920	1,920
Building "C"					$11,670
	Library	1	each	8,670	8,670
	Resource Center	3	each	1,000	3,000
Building "O"					$ 4,940
	Gymnasium	1	each	4,940	
	TOTAL FURNITURE & EQUIPMENT				$42,530

	Estimated Quantity	Unit	Unit Cost	Total Cost
ELECTRICAL				
Handhole	3	ea	$ 1,200.00	$ 3,600
Ductline	14,000	lf	1.10	15,400
Trenching & Backfilling	1,560	lf	4.50	1,020
Sub Distribution Center	3	ea	1,500.00	4,500
Area Lighting	9	ea	400.00	3,600
Distribution Feeder	4,000	lf	10.00	40,000
Area Lighting Feeder	710	lf	..70	499
	TOTAL ELECTRICAL			$ 74,619
CIVIL				
Site Preparation	38,720	cy	4.14	$ 160,300
Roadway & Parking				
A.C. Parking & Curbing	4,740	sy	5.11	24,222
Concrete Sidewalk	41,552	sf	1.50	62,328
Drainage System				
18" Drain Pipe	520	lf	16.00	8,320
12" Drain Pipe	375	lf	12.00	4,500
8" Drain Pipe	245	lf	10.00	2,450
6" Drain Pipe	480	lf	8.00	3,840
Grating Inlet	6	ea	550.00	3,300
Area Drain	9	ea	100.00	900
Catch Basin	1	ea	750.00	750
Sewer System				
6" V.C. Pipe	743	lf	15.00	11,145
Sewer Manhole	1	ea	705.00	705
Cleanout	8	ea	70.00	560
Water System				
8" C.I. Pipe	285	lf	16.00	4,560
6" C.I. Pipe	295	lf	13.00	3,835
$2\frac{1}{2}$" copper pipe	110	lf	7.00	770
3" copper pipe	100	lf	8.00	800
4" C.I. Pipe	170	lf	10.00	1,700
$2\frac{1}{2}$" Gate Valve	4	ea	100.00	400
Valve Boxes	60	ea	70.00	420
F. H., Gate Valves		ls		635
Landscaping & Sprinkler	7	ac	10,697.00	74,880
Miscellaneous Structures				
CRM Wall	1,397	cy	60.00	83,820
Misc. & Appurtenances		ls		27,180
	TOTAL CIVIL			$ 482,320

Third Increment Budget

Business (11-CR)	$ 491,156
Library	464,690
Gymnasium	1,026,000
Saran House	36,000
Green House	24,000
Bleachers (Baseball)	37,800
Furniture & Equipment	42,530
Electrical	74,619
Civil	482,320
Construction Cost (1/71) /71	2,679,115
Escalation (41 mos. @ .5%)	549,885
Construction Cost	$3,229,000
Contingency	30,000
Inspection	35,000
Design	178,000
	$3,472,000
Work of Art and Landscaping	69,000
Total Funds Required	$3,541,000

13.3 Schedule

The latest start time schedule for this increment is as follows:

August 1972	Start Design
February 1974	Start Contract Procedure
May 1974	Start Construction
August 1975	Complete Construction

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NG, BUILDING DEVELOPMENT, POWER & COMMUNICATIONS PLAN – THIRD INCREMENT

ANBE, ARUGA AND ASSOCIATES, INC ARCHITECTS

XXV

CHAPTER 14 - FOURTH INCREMENT

14.1 - Facilities

Under the fourth increment, Figure XXVI, the following facilites will be constructed:

Building "K" - Language, 11-CR
Building "E" - Lecture Demonstration

14.2 - Cost

The computations for the fourth increment funding requirements are shown herein.

Buildings	Area	Unit Cost	Cost
LANGUAGE (11-CR)			
Classrooms, Techers' Workroom	12,400	$24.00	$297,600
Toilets & Janitor	1,904	35.00	66,640
Lanais & Stairs	4,340	11.00	47,740
	18,644		$411,980
LECTURE-DEMONSTRATION			
Interior Spaces	2,500	34.00*	$ 85,000
TOTAL BUILDING COST			$496,980

FURNITURE AND EQUIPMENT

Building	Description	Estimated Quantity	Unit	Unit Price	Total Cost
Building "K"					$ 13,110
Language (11-CR)	Language	7	each	$1,135	7,945
	English	2	each	1,135	2,270
	Language Lab	1	each	1,135	1,135
	Drama, Pub. Sp.	1	each	1,135	1,135
	Teachers' Workroom	1	each	625	625
	TOTAL FURNITURE & EQUIPMENT				$ 13,110

* Includes Air Conditioning

	Estimated Quantity	Unit	Unit Cost	Total Cost
ELECTRICAL				
Ductline	1,909	lf	$ 1.10	$ 2,100
Trenching & Backfilling	133	lf	4.50	600
Distribution Feeder	307	lf	7.50	2,300
	TOTAL ELECTRICAL			$ 5,000
CIVIL				
Site Preparation	7,501	cy	4.03	$ 30,230
Sewer System	50	lf	12.20	610
Water System	60	lf	6.33	380
Landscaping	.28	ac	9,822.00	2,750
Misc. Structures		ls		2,080
	TOTAL CIVIL			$ 36,050

Fourth Increment Budget	
Language (11-CR)	$ 411,980
Lecture - Demonstration	85,000
Furniture & Equipment	13,110
Electrical	5,000
Civil	36,050
Construction Cost (1/71)	$ 551,140
Escalation (59 mos. @ .5%)	162,860
Construction Cost	$ 714,000
Contingency	18,000
Inspection	12,000
Design	59,000
	$ 803,000
Works of Art and Landscaping	17,000
Total Funds Required	$ 820,000

14.3 Schedule

The latest start time schedule for this increment is as follows:

September 1974 - Start Design
August 1975 - Start Contract Procedure
November 1975 - Start Construction
August 1976 - Complete Construction

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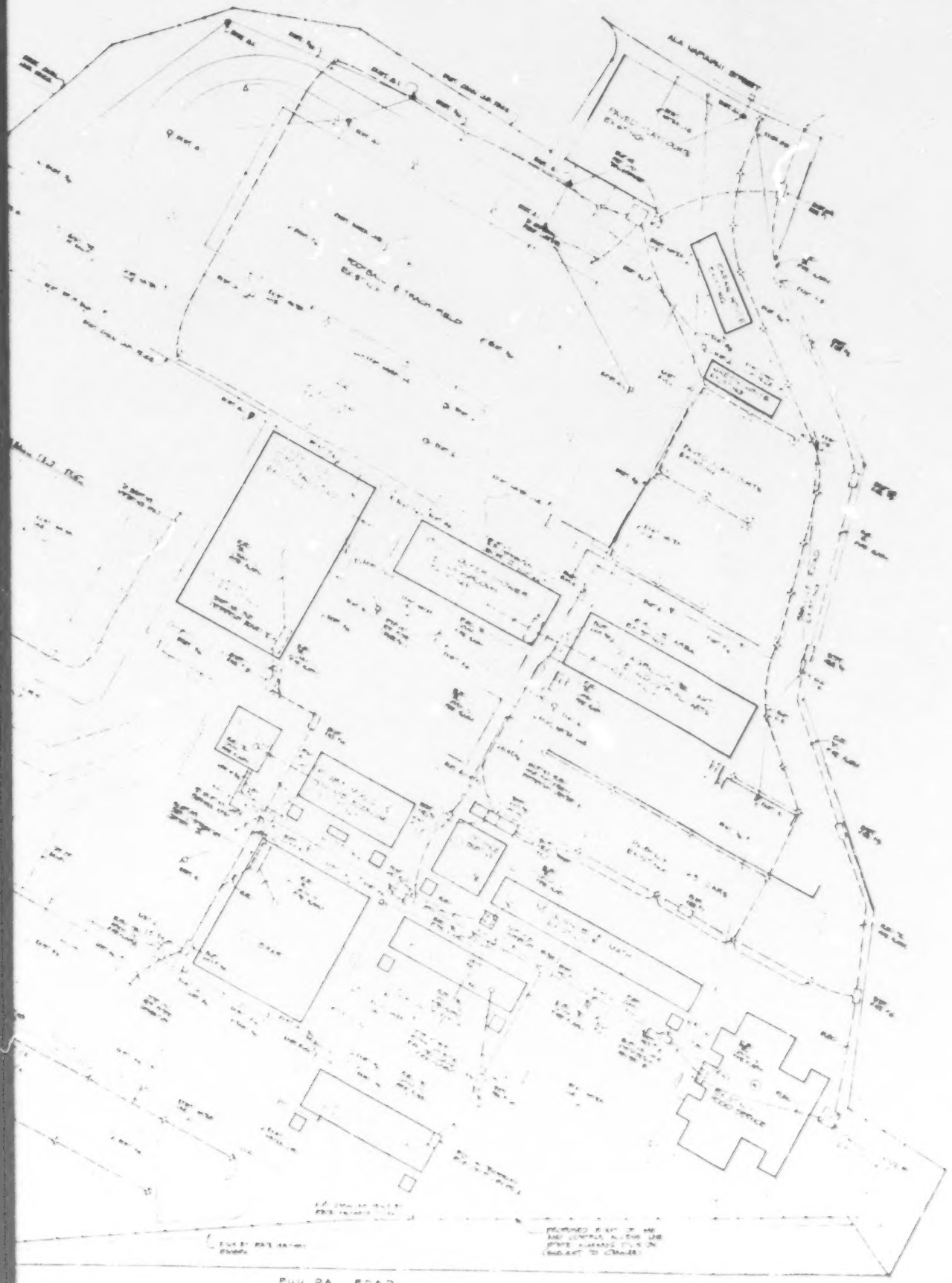

BUILDING DEVELOPMENT, POWER & COMMUNICATIONS PLAN — FOURTH INCREMENT ANDE, ARUGA AND ASSOCIATES, INC ARCHITECTS XXVI

CHAPTER 15 -FIFTH INCREMENT

15.1 - Facilities

Under the fifth increment, Figure XXVII, the following facilites will be constructed:

Building "A" - Administration
Building "B" - Counseling
Parking, (48 cars)

15.2 - Cost

The computations for the fourth increment funding requirements are shown herein.

Buildings	Area	Unit Cost	Cost
ADMINISTRATION			
Interior Spaces	2,535	$25.00	$ 63,375
Toilets	200	35.00	7,000
TOTAL	2,735 S.F.		$ 70,375
COUNSELING			
Interior Spaces	3,330	$25.00	$ 83,250
Toilets	50	35.00	1,750
	3,380		$ 85,000
TOTAL BUILDING COST			$155,375

FURNITURE AND EQUIPMENT

Building	Description	Estimated Quantity	Unit	Unit Price	Total Cost
Building "A"					$ 1,240
	Administration	1	each	$1,240	
Building "B"					$ 1,240
	Counseling	1	each	$1,240	
	TOTAL FURNITURE & EQUIPMENT				$ 2,480

	Estimated Quantity	Unit	Unit Cost	Total Cost
ELECTRICAL				
Ductline	2,263	lf	$ .75	$ 1,697
Trenching & Backfilling	144	lf	4.50	648
Distribution Feeder	354	lf	7.50	2,655
	TOTAL ELECTRICAL			$ 5,000
CIVIL				
Site Preparation	340	cy	$ 4.53	$ 1,540
Parking	1,684	sy	5.00	8,420
Sewer System	77	lf	10.00	770
Water System				
1½" copper pipe	25	lf	5.00	125
2" copper pipe	25	lf	6.00	150
2½" copper pipe	47	lf	7.00	329
6" C.I. Pipe	45	lf	13.00	585
Gate Valves, Boxes, etc.		ls		291
Landscaping & Sprinklers	.04	ac	19,750.00	790
Misc. Appurtenances		ls		760
	TOTAL CIVIL			$ 13,760

Fifth Increment Budget	
Administration	$ 70,375
Counseling	85,000
Furniture & Equipment	2,480
Electrical	5,000
Civil	13,760
Construction Cost 1/71)	$ 176,615
Escalation (74 mos. @ .5%)	65,385
Construction Cost	$ 242,000
Contingency	7,000
Inspection	7,000
Design	25,000
	$ 281,000
Works of Art and Landscaping	6,000
Total Funds Required	$ 287,000

15.3 Schedule

The latest start time schedule for this increment is as follows:

March 1976 - Start Design
November 1976 - Start Contract Procedure
February 1977 - Start Construction
August 1977 - Complete Construction

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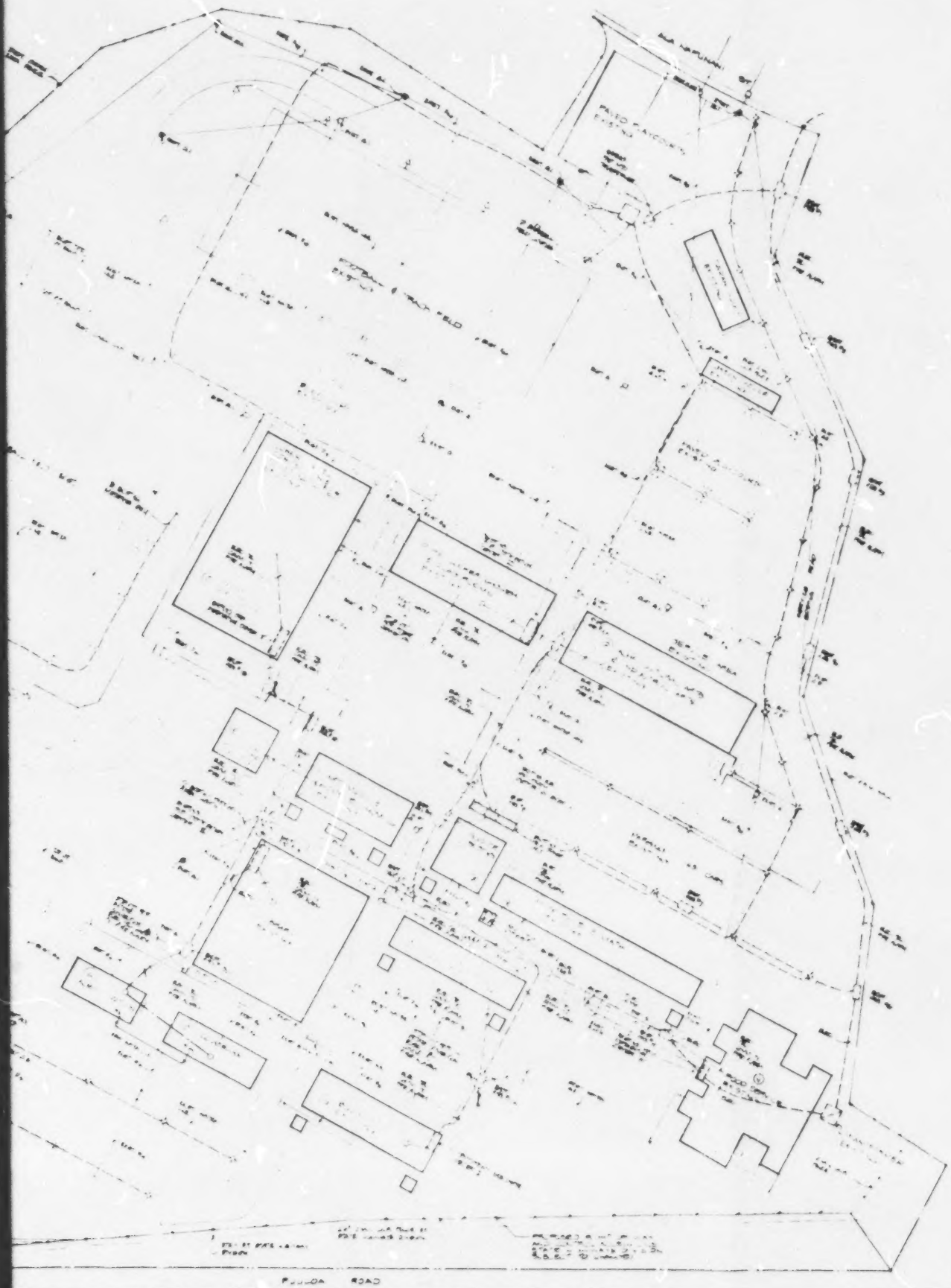

Page 79

BUILDING DEVELOPMENT, POWER & COMMUNICATIONS PLAN — FIFTH INCREMENT

ANDE, ARUBA AND ASSOCIATES, INC ARCHITECTS

XXVII

CHAPTER 16 - SIXTH INCREMENT

16.1 Facilities

Under the sixth increment Figure XXVIII, the following facility will be constructed:

Swimming Pool
Pool Bleachers (Seats)

16.2 Cost

The computations for the sixth increment funding requirements are shown herein.

Facility	Area	Unit Cost	Cost
Swimming Pool	3,380	$ 35.00	$ 118,300
Pool Equip. & Sterilz. Rm.	500	30.00	15,000
Pool Bleachers (Seats)	1,260	30.00	37,800
			$ 171,100

	Estimated Quantity	Unit	Unit Cost	Total Cost
ELECTRICAL				
Ductline	150	lf	$ .50	$ 75
Trenching & Backfilling	47	lf	4.25	200
Distribution Feeder	132	lf	1.70	225
	TOTAL ELECTRICAL			$ 500

CIVIL
NIL

Sixth Increment Budget	
Swimming Pool Facility	$ 171,100
Electrical	500
Civil	NIL
Construction Cost (1/71)	$ 171,600
Escalation (84 mos. @ .5%)	72,400
Construction Cost	$ 244,000
Contingency	7,000
Inspection	7,000
Design	25,000
	$ 283,000
Works of Art and Landscaping	6,000
Total Funds Required	$ 289,000

16.3 Schedule

The latest start time schedule for this increment is as follows:

February 1977 - Start Design
October 1977 - Start Contract Procedure
January 1978 - Start Construction
August 1978 - Complete Construction

FOOTBALL & TRACK FIELD
ALA KAPUHANI
MAIN ACCESS ROAD EXISTING
PROPOSED RIGHT OF WAY LINE CITY & COUNTY OF HONOLULU SUBJECT TO CHANGE UNTIL CIVIL SITE WORK
PARKING EXISTING 230 CARS
SALT LAKE BLVD
PUULOA ROAD

MOANALUA HIGH SCHOOL MOANALUA, OAHU, HAWAII BUILDING DEVELOPMENT, POWER & COMMUNICATIONS PLAN — SI

BUILDING DEVELOPMENT, POWER & COMMUNICATIONS PLAN — SIXTH INCREMENT

ANDO, ARUGA AND ASSOCIATES, INC ARCHITECTS

XXVIII

CHAPTER 17 - SEVENTH INCREMENT

17.1 Facilities

Under the seventh increment, Figure XXIX, the following facility will be constructed:

Building "D" - Auditorium

17.2 Cost

The computations for the seventh increment funding requirements are shown herein.

Building	Area	Unit Cost	Cost
AUDITORIUM			
Interior Spaces	15,200	$ 30.00*	$ 456,000
Toilets & Janitor	460	35.00	16,100
TOTAL	15,660 sf		$ 472,100

	Estimated Quantity	Unit	Unit Cost	Total Cost
ELECTRICAL				
Ductline	600	lf	$ 75.00	$ 450
Trenching & Backfilling	100	lf	4.50	450
Distribution Feeder	240	lf	10.00	2,400
Sub Distribution Feeder	1	ea	1,500.00	1,500
TOTAL ELECTRICAL				$ 4,800
CIVIL				
Site Preparation	342	cy	$ 4.56	$ 1,560
Conc. Side Walk	3,360	sf	1.50	5,040
Sewer System	17	lf	14.75	250
Drainage System				
6" Pipe	80	lf	8.00	640
Grating Inlet	2	ea	250.00	500
Water				
$2\frac{1}{2}$" Copper Pipe	125	lf	7.00	875
Landscaping	.017	ac	6,000.00	100
Misc. Structures	745	cy	64.18	47,815
TOTAL CIVIL				$ 56,780

* Does not include air conditioning

	Cost
Seventh Increment Budget	
Auditorium	$ 472,100
Electrical	4,800
Civil	56,780
Construction Cost (1/71)	$ 533,680
Escalation	248,320
Construction Cost	$ 782,000
Contingency	18,000
Inspection	13,000
Design	62,000
	$ 875,000
Works of Art and Landscaping	18,000
Total Funds Required	$ 893,000

17.3 Schedule

The latest start time schedule for this increment is as follows:

August 1977 - Start Design
July 1978 - Start Contract Procedure
October 1978 - Start Construction
August 1979 - Complete Construction

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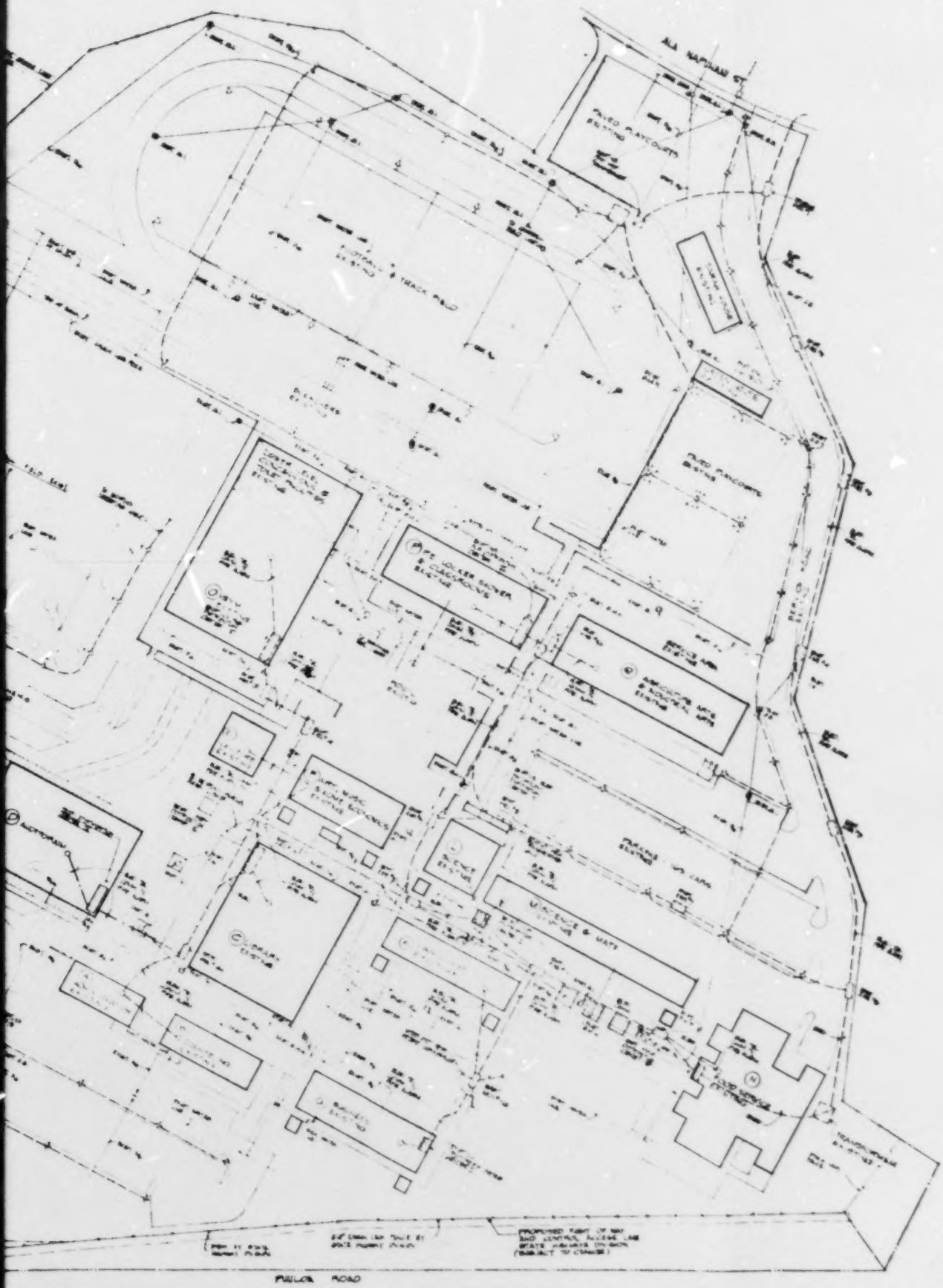


LDING DEVELOPMENT, POWER & COMMUNICATIONS PLAN — SEVENTH INCREMENT AMBE, KRUSS AND ASSOCIATES, INC ARCHITECTS XXIX

CHAPTER 18 - EIGHTH, NINTH & TENTH INCREMENTS

18.1 Facilities

Under the eight, ninth and tenth increments, Figures XXX and XXXI, the following facilities will be constructed under a long range program.

Building "I" - Social Studies, 13-CR (8th Increment)
Parking - 132 cars (8th Increment)

Building "H" - Language, 4-CR Social Studies, 4-CR; Science Labs, 2-CR; (9th Increment)
Building "J" - Language, 15-CR (10th Increment)

18.2 Cost

The computations for the eighth, ninth, and tenth increments funding requirements are shown herein.

18.2.1 Eighth Increment

Building	Area	Unit Cost	Cost
SOCIAL STUDIES			
Classrooms	12,480	$ 24.00	$ 299,520
Toilets & Janitors	1,904	35.00	66,640
Lanais & Stairs	4,340	11.00	47,740
TOTAL	18,724 sf		$ 413,900

FURNITURE AND EQUIPMENT

Building	Description	Estimated Quantity	Unit	Unit Price	Total Cost
Building "I"					$ 14,755
Social Studies	General	13	each	$ 1,135	
TOTAL FURNITURE & EQUIPMENT					$ 14,755

	Estimated Quantity	Unit	Unit Cost	Total Cost
ELECTRICAL				
Ductline	320	lf	$ .50	$ 160
Trenching & Backfilling	320	lf	5.50	1,760
Distribution Feeder	360	lf	1.50	525
Area Lighting	4	ea	400.00	1,600
Relocate Sub Distribution Center	1	ea		2,000
	TOTAL ELECTRICAL			$ 6,045
CIVIL				
Site Preparation	230	cy	$ 8.40	$ 1,930
Parking & Sidewalk	5,817	sy	5.25	30,540
Sewer & System	95	lf	11.47	1,090
Water System	20	lf	6.00	120
Landscaping	.78	ac	17,333.00	13,520
Misc. Structures	89	cy	111.00	9,880
				$ 57,080

Eighth Increment Budget	
Social Studies (13-CR)	$ 413,900
Furniture & Equipment	14,755
Electrical	6,045
Civil	57,080
Construction Cost (1/71)	$ 491,780
Contingency	14,000
Inspection	10,000
Design	43,000
	$ 558,780
Works of Art and Landscaping	11,220
Total Funds Required	$ 570,000*

18.2.2 Ninth Increment

Building	Area	Unit Cost	Cost
LANGUAGE			
Classrooms	7,680	$ 24.00	184,320
Science Labs	3,200	31.00**	$ 99,200
Lanais	8,098	11.00	89,078
TOTAL	18,978		$ 372,598

* Due to long range, escalation not included.

** Includes Standard Equipment

FURNITURE AND EQUIPMENT

Building	Description	Estimated Quantity	Unit	Unit Price	Total Cost
BUILDING "H"					$ 11,000
Language, Social Studies and Science (10-CR)					
	Large Soc. St. CR	1	each	4,540.00	4,540
	Large Lang. CR	1	each	4,540.00	4,540
	Science Lab	2	each	960.00	1,920
ELECTRICAL					
Ductline		120	lf	$ 1.85	$ 222
Trenching & Backfill		20	lf	6.00	120
Distribution Feeder		60	lf	2.63	158
	TOTAL ELECTRICAL				$ 500
CIVIL					
Site Preparation		329	cy	$ 4.54	$ 1,494
Conc. Sidewalk		4,264	sf	1.50	6,396
Sewer System		60	lf	15.00	900
Water System		35	lf	7.14	250
Landscaping		.24	ac	9,917.00	2,380
Misc. & Appurtenances			ls		900
	TOTAL CIVIL				$ 12,320

Ninth Increment Budget	
Language (10-CR)	$ 372,598
Furniture & Equipment	11,000
Electrical	500
Civil	12,320
Construction Cost (1/71)	$ 396,418
Contingency	12,000
Inspection	9,000
Design	36,000
	$ 453,418
Works of Art and Landscaping	9,582
Total Funds Required	$ 463,000*

* Due to Long Range, escalation not included.

18.2.3 Tenth Increment

Building	Area	Unit Cost	Cost
LANGUAGE			
Classrooms	14,400	$ 24.00	$ 345,600
Lanais & Stairs	4,620	11.00	50,820
TOTAL	19,020		$ 396,420

FURNITURE AND EQUIPMENT

Building	Description	Estimated Quantity	Unit	Unit Price	Total Cost
BUILDING "J"					$ 17,025
Language (15-CR)	English	15	each	$ 1,135.00	$ 17,025
ELECTRICAL					
Ductline		400	lf	$ 1.85	$ 740
Trenching & Backfill		65	lf	6.00	390
Distribution Feeder		100	lf	2.52	252
		TOTAL ELECTRICAL			$ 1,382

CIVIL
NIL

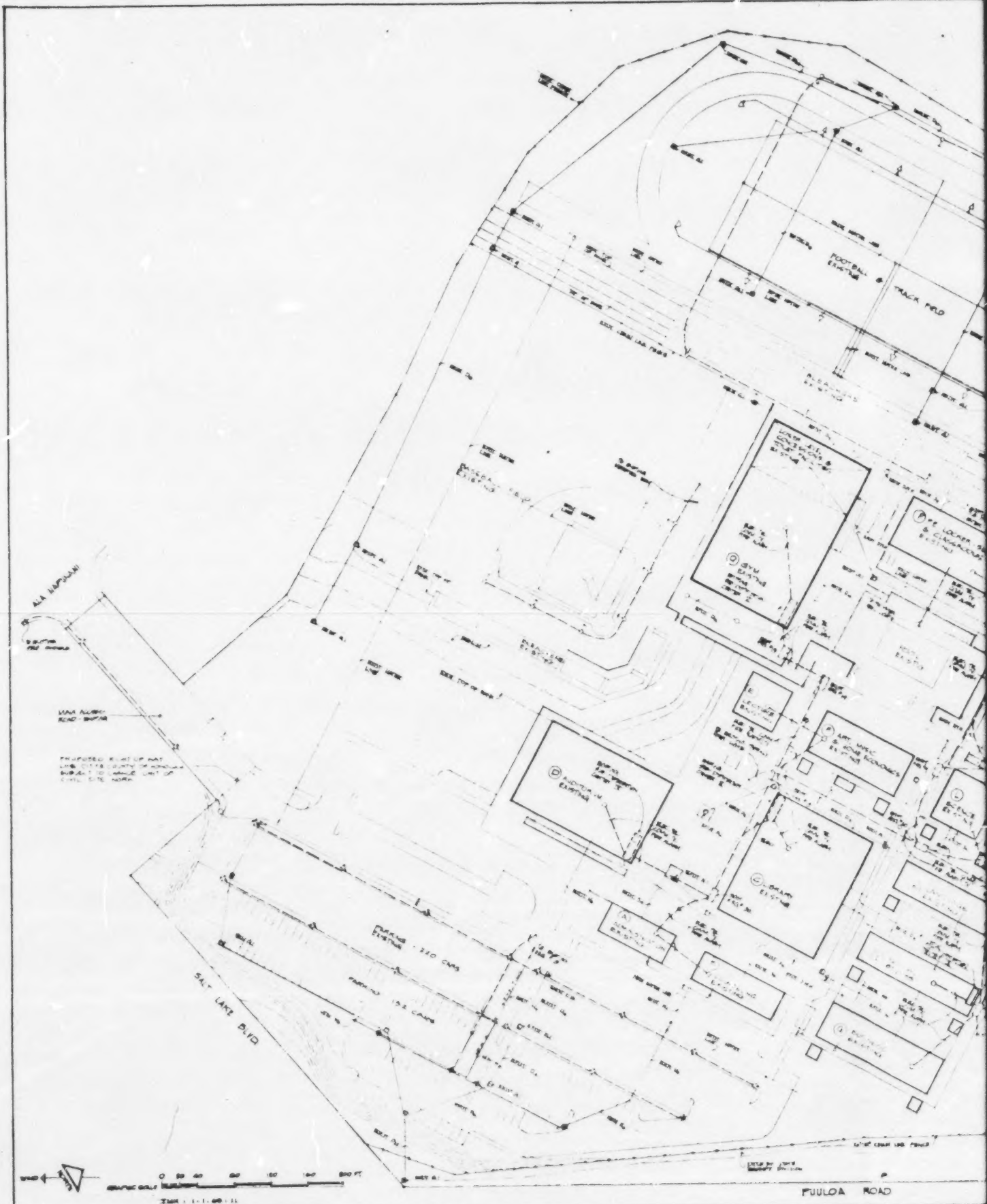
Tenth Increment Budget	
Language (15-CR)	$ 396,420
Furniture & Equipment	17,025
Electrical	1,382
Civil	NIL
Construction Cost (1/71)	$ 414,827
Contingency	13,000
Inspection	9,000
Design	37,000
	$ 473,827
Works of Art and Landscaping	10,173
Total Funds Required	$ 484,000*

* Due to Long Range, escalation not included.

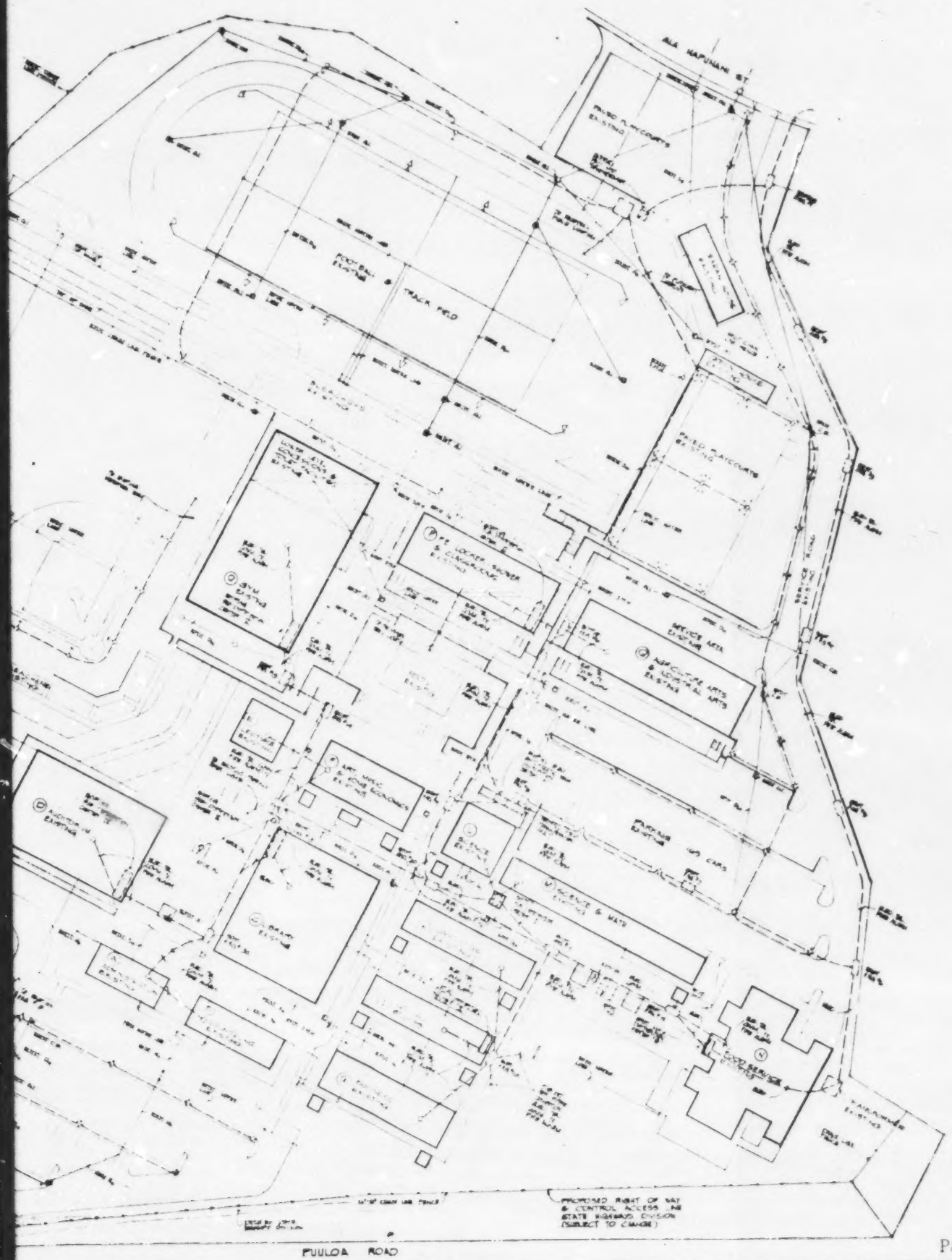
18.3 Schedule

The time schedule for these increments are based on the estimated student enrollment as follows:

8th Increment	2,300 Students
9th Increment	2,600 Students
10th Increment	3,000 Students



MOANALUA HIGH SCHOOL MOANALUA, OAHU, HAWAII BUILDING DEVELOPMENT, POWER & COMMUNICATIONS PLAN —

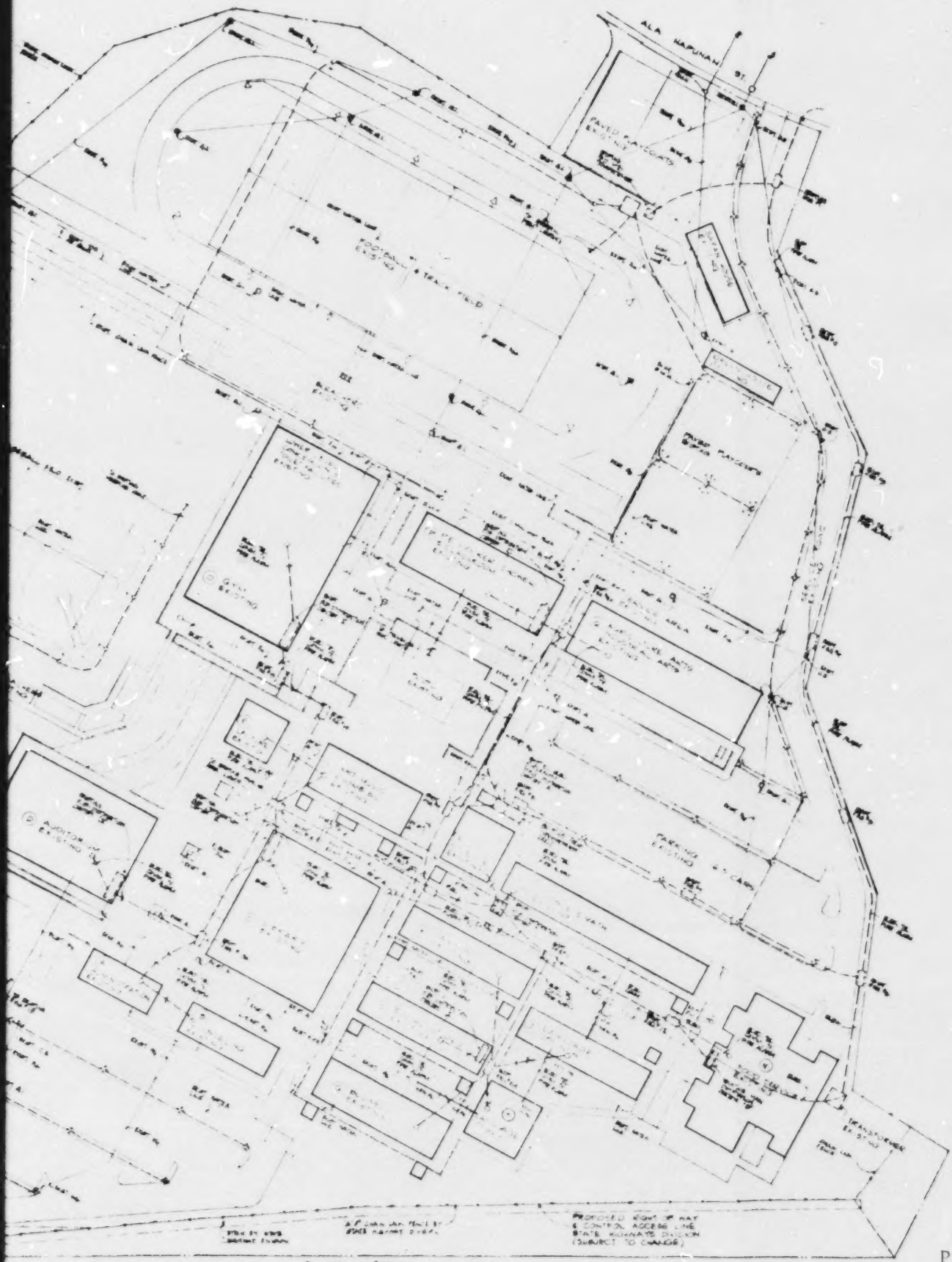


BUILDING DEVELOPMENT, POWER & COMMUNICATIONS PLAN – EIGHTH INCREMENT

ANSE. ANUSA AND ASSOCIATES, INC ARCHITECTS

XXX

MOANALUA HIGH SCHOOL
BUILDING DEVELOPMENT, POWER & COMMUNICATIONS PLAN – NINTH &
PUULOA ROAD



DING DEVELOPMENT, POWER & COMMUNICATIONS PLAN – NINTH & TENTH INCREMENT ARBE, ABUBA AND ASSOCIATES, INC ARCHITECTS XXXI

CHAPTER 19 - BUDGETING

Under the Capital Improvements Program (CIP), the Legislature appropriates necessary funds to implement each increment of construction. The budgeting for the First Increment is appropriated on the 1970 CIP. Subsequent incremental budgeting is based on a "double" fiscal year basis commencing with the 1971-73 biennium. The first and second fiscal years of the biennium will be from July 1, 1971, to June 30, 1972, and from July 1, 1972, to June 30, 1972, respectively. Funds for each fiscal year become available July 1 of that year.

The combined design and contract time for each increment of Moanalua High School varies from 6 to 18 months, therefore it is not necessary to obtain the planning and construction for a particular increment in the same fiscal year. Time Schedule, Figure XXXII, has been prepared to indicate when design and construction funds for each increment are required.

INCREMENT	ACTIVITY	COST	1970 J F M A M J J A S O N D	197 J F M A M J J
FIRST	DESIGN	178,000	●	
	CONSTRUCTION	3,397,000		
SECOND	DESIGN	145,000		
	CONSTRUCTION	2,720,000		
THIRD	DESIGN	190,000		
	CONSTRUCTION	3,363,000		
FOURTH	DESIGN	91,000		
	CONSTRUCTION	161,000		
FIFTH	DESIGN	140,000		
	CONSTRUCTION	2,162,000		
SIXTH	DESIGN	28,000		
	CONSTRUCTION	264,000		
SEVENTH	DESIGN	42,000		
	CONSTRUCTION	831,000		

12,000 145

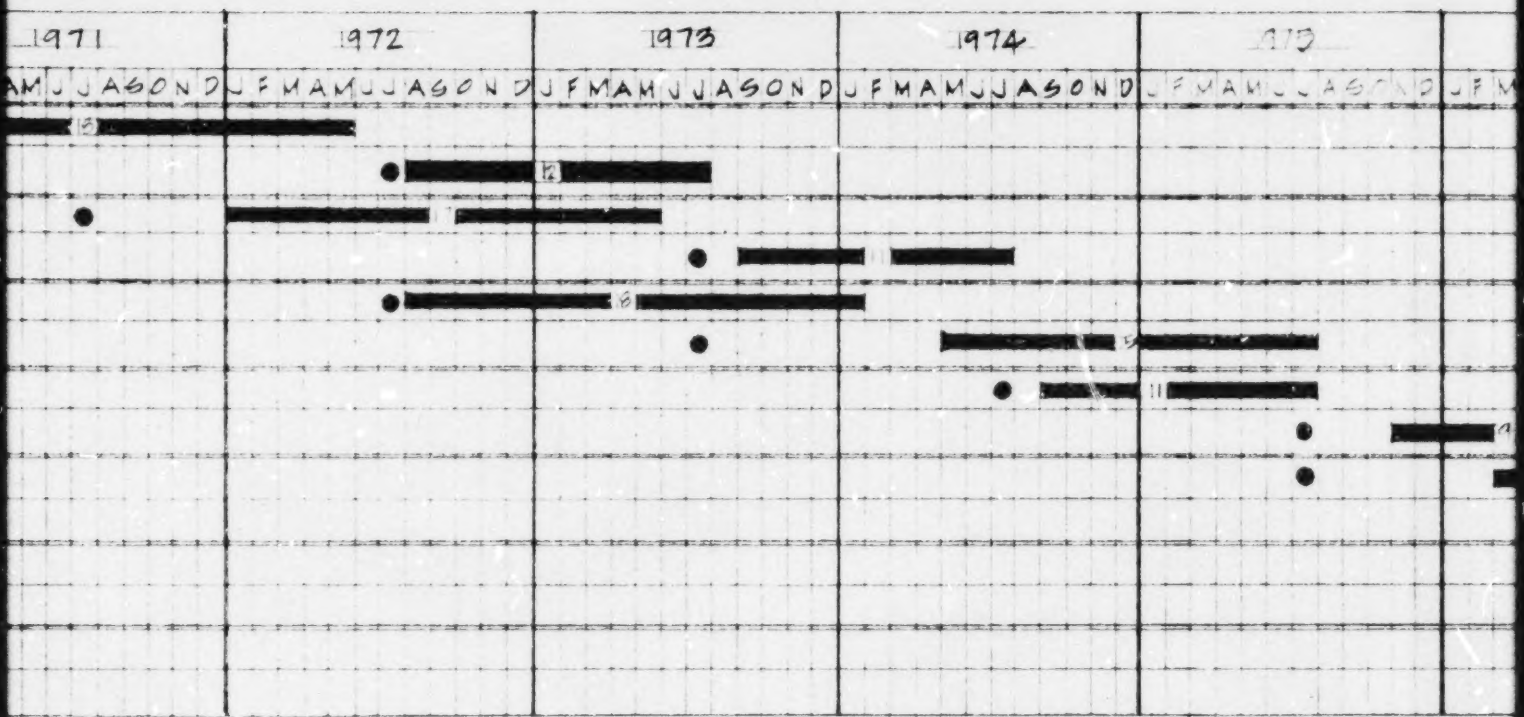
1970 = 197 FISCAL YEAR

LEGEND

● - INDICATES BEGINNING OF FISCAL YEAR WHEN FUNDS ARE REQUIRED.

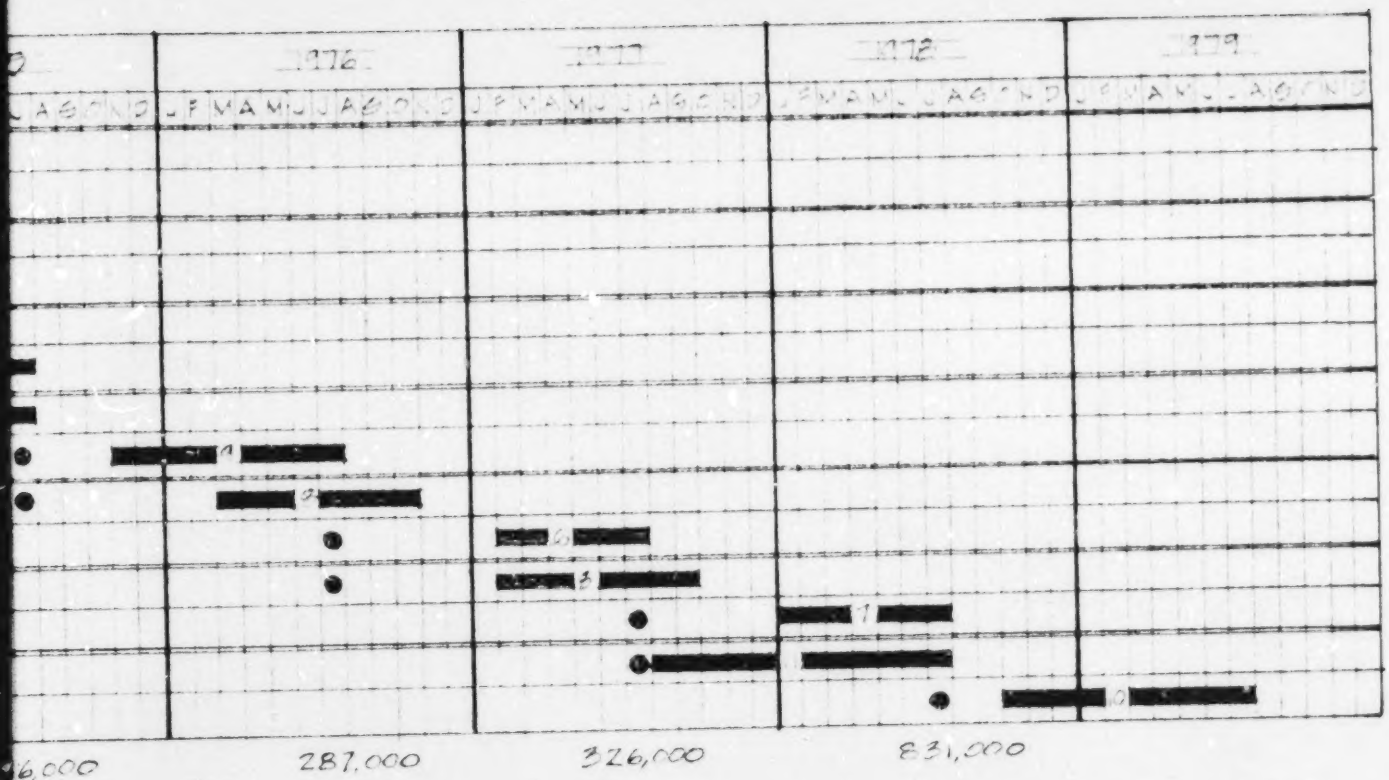
■ # ■ INDICATES NUMBER OF MONTHS TO BEGIN OF CONSTRUCTION PROJECT

TIME SCHEDULE



145 [illegible] 3,575,000 2,783,000 [illegible] 786,000

[illegible] BIENNIUM [illegible] BIENNIUM [illegible]



1975 - 1977 BENNUM

1977 - 1979 BENNUM